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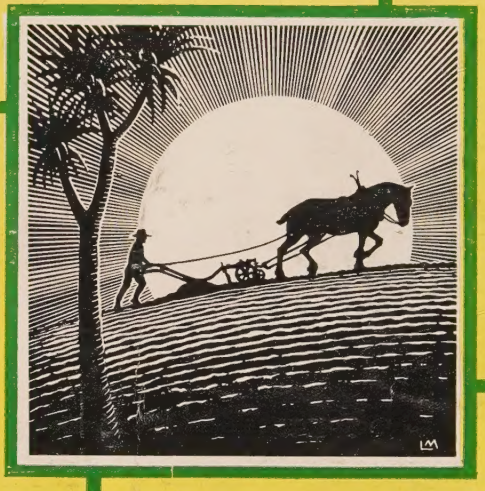

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The NEW ZEALAND JOURNAL OF AGRICULTURE

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Control Of Feed Flavour

Trial Reveals No Loss In Production When Cows Are Spelled Before Milking

J. E. DAVIES, Instructor in Agriculture, Hawera.

THIS trial, together with the trial on the same farm reported in the "Journal" for September, 1938, is concerned only with the possible effect on the milk or butterfat production of a dairy herd which is taken off the pastures or kept off all other feed at least three hours before the afternoon milking. The trial at the Ruakura Farm, reported in the February, 1939, issue served to confirm the evidence on which the trials at the demonstration farm were based, namely, that by removing the herd from taint producing feed at least three hours before milking, the intensity of the taint or feed flavour in the cream could be reduced sufficiently to improve the grading considerably.

The possible effect on the milk production of a dairy herd which is taken off pastures for at least three hours before the afternoon milking in order to control feed flavour was again the subject of a trial at Waimate West Demonstration Farm last season. This trial showed that production was not affected by this procedure, and furthermore, that it was not necessary for the procedure to be continuous but that it could be changed to meet the condition of the pastures.

In the first trial at the Waimate West Demonstration Farm, carried out in the 1937-38 season, the herd was divided into two. One herd was brought in from the paddocks each afternoon three hours before milking time, while the other herd was brought in to be milked at once in the usual way. Over a period of five months from September to March, during which the amount of feed available in the paddocks varied as the season changed, the herd brought in to stand in a bare enclosure more than held its own in production with the herd milked immediately on coming in.

Variation in Trial

It was intended to repeat this trial in the 1938-39 season, but there was another point that seemed worthy of investigation. Was it necessary once the herd management was changed, by taking the cows off the feed three hours before milking to persist in this procedure all the season, or could the herd be chopped and changed to meet the position regarding feed flavour? Feed flavour comes and goes, some paddocks are worse than others, some months are worse than others,

Cows waiting for the afternoon milking. They have been withdrawn from pasture three hours before milking, and have been placed in a paddock devoid of feed.

and some seasons are worse than others.

The first trial showed that once the herd was started on the new procedure, production was maintained through the ups and downs of feed supply of a normal season, but it seemed essential to find out whether the herd could be chopped and changed from the ordinary procedure to that of coming in to stand for three hours without a marked upset in milk production. If this could be done without loss of production, then it would not be necessary to keep on with the new procedure if once started, should the season, or condition of the feed, make it unnecessary from the feed flavour point of view.

The second trial was designed, therefore, to test this point as well as to confirm or otherwise the general experience of the first trial.

The herd of 72 cows was not divided, but from September 21st to December 10th the procedure was changed every 10 days from coming in to be milked at once to coming in and standing in a small bare paddock for three hours before the evening milking.

The small paddock was kept sufficiently bare to provide no feed and for the purpose of allowing the cows some comfort, as well as keeping them off feed, was much to be preferred to the concrete yards.

The ten-day period was made to coincide with the usual ten-day test period, but this regularity of the change had no significance in so far as the cows were concerned.

Production Not Affected

That the general production of the herd was not affected to any marked extent by being taken off the pastures to stand for three hours is shown by the figures for each ten-day period which are given in Table 1.

TABLE 1.

Butterfat production for the 10 day periods the herd was under ordinary management, compared with the production for similar periods under special management.

10-Day Periods.	Ordinary Management. Butterfat in lbs.	Special Management. Butterfat in lbs.
September 21st—30th	829.8	—
October 1st—10th	—	864.2
October 11th—20th	933.5	—
October 21st—30th	—	970.4
October 31st—November 9th	960.0	—
November 10th—19th	—	955.1
November 20th—29th	873.7	—
November 30th—December 9th	—	823.1
TOTALS	3,597.0	3,612.8

The total production for the four periods of ordinary management was 3,597lbs. butterfat and that for the four periods when the herd was brought in three hours before milking, 3,612.8lbs., a difference of only 15lbs. in favour of the latter procedure, which is accounted for by the fact that the rise and fall in production tended to be in favour of such a difference.

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Significant Point

Of much more significance in connection with the possible effect of sudden changes in procedure on production is the comparison of the daily milk yields immediately before and after each change.

In Table 2 the daily yields for three days before each change are compared with the daily yields for the three days after the change.

TABLE 2.

Comparison of daily yields of milk before and after each change in herd management.

A.—Changes from ordinary milking procedure to being held off feed for 3 hours.

Dates.	Milk Yields Lbs.	Totals.	Differences.
Sept. 28 ..	1911		
29 ..	1900		
30 ..	1927	5738	
Change			
Oct. 1 ..	1889		
2 ..	1889		
3 ..	2001	5779	+ 41
Oct. 18 ..	2027		
19 ..	2034		
20 ..	2025	6086	
Change			
Oct. 21 ..	2244		
22 ..	2135		
23 ..	2174	6553	+ 467
Nov. 8 ..	1976		
9 ..	2005		
10 ..	2015	5996	
Change			
Nov. 11 ..	2022		
12 ..	2050		
13 ..	1979	6051	+ 55
Change			
Nov. 28 ..	1943		
29 ..	1860		
30 ..	1803	5606	
Change			
Dec. 1 ..	1885		
2 ..	1820		
3 ..	1927	5632	+ 26

B.—Changes from being held off feed for 3 hours to ordinary procedure.

Dates.	Milk Yields Lbs.	Totals.	Differences.
Oct. 8 ..	1895		
9 ..	1950		
10 ..	1957	5802	
Change			
Oct. 11 ..	1980		
12 ..	2012		
13 ..	2027	6019	+ 217
Oct. 29 ..	2190		
30 ..	2194		
31 ..	2088	6472	
Change			
Nov. 1 ..	2142		
2 ..	2103		
3 ..	2065	6210	— 262
Nov. 18 ..	1990		
19 ..	1930		
20 ..	1912	5832	
Change			
Nov. 21 ..	1870		
22 ..	1862		
23 ..	1912	5644	— 188

It will be noted that there is no marked rise or fall in the milk yield inconsistent with the normal fluctuations from one day to the next when the change in procedure is made. There is, however, a definite trend towards a rise in production for the first three days after the change from ordinary procedure to that of bringing the cows in to stand for three hours and a fall in production when this change is reversed. There is but one exception to this statement, namely, the rise recorded in production on changing the herd back to ordinary practice on October 11th.

No Loss of Production

The results of this experiment and of the trial in the previous season show that the herd can be held off feed for three hours without loss of production. This year's trial further shows that the herd can be changed from coming in from the paddocks to be milked at once to coming in three hours earlier to stand in a bare enclosure before the evening milking with no loss of production. The Ruakura Farm trials and previous feeding trials with taint-producing feeds show that the intensity of feed flavour is definitely reduced by withholding the cows from such feed for at least three hours before milking.

The farmer has, therefore, at his command a readily and easily applied method of reducing the intensity of feed flavours whenever this trouble is experienced. The experience at the Manaia Farm is definitely in favour of a small holding paddock with water laid on rather than the use of the concrete yard for holding the cows. The small enclosure after the first day or two is quite devoid of feed, but is much more comfortable for the cows when lying down, and, especially if shade is available, the cows are quite contented in it. Yards are also likely to be dirty enough when feed flavour is bad without the herd being in the yard an additional three hours.

Several farmers in South Taranaki have adopted the practice of bringing in the herd soon after lunch this season, and, although feed flavour was not prevalent, the opinion has been definitely expressed by these men that the herd has milked better and the grade of the cream has been consistently higher. The cows are cool and quiet when being milked and are always quite ready for milking.

No serious objection to holding the herd in a quite small, bare paddock has been raised by any of those who have tried the practice, which can confidently be recommended as the simplest and most efficient method of reducing feed flavours in cream that has yet been devised.

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"Land Deterioration Is A Grave

Serious Position of Large Areas Of Our Hill Country Sheep Farms

R. P. CONNELL, Land Utilisation Officer, Wellington.

LAND DETERIORATION is well to the front in the news in New Zealand at the present time. The Press, farmers' organisations, and officers of various State Departments have all shown a tendency recently to give greater attention to various phases of the deterioration with which we are faced in parts of our farming land.

Even a superficial study of the statements that are being put forward makes it clear that the deterioration which is being considered is largely that of land devoted to sheep farming.

To some it may come as a jarring surprise to be told, as we are being told in these statements, that grave deterioration has taken place and is taking place in our land being used principally for sheep farming. In fact, in face of evidence which apparently points to the opposite, it seems scarcely possible that such statements are right.

The various forms of land deterioration are outlined in this article. The principal areas affected are those devoted to hill country sheep farming, which is really the foundation of the fat lamb trade, and the problem is a grave phase of our national economy.

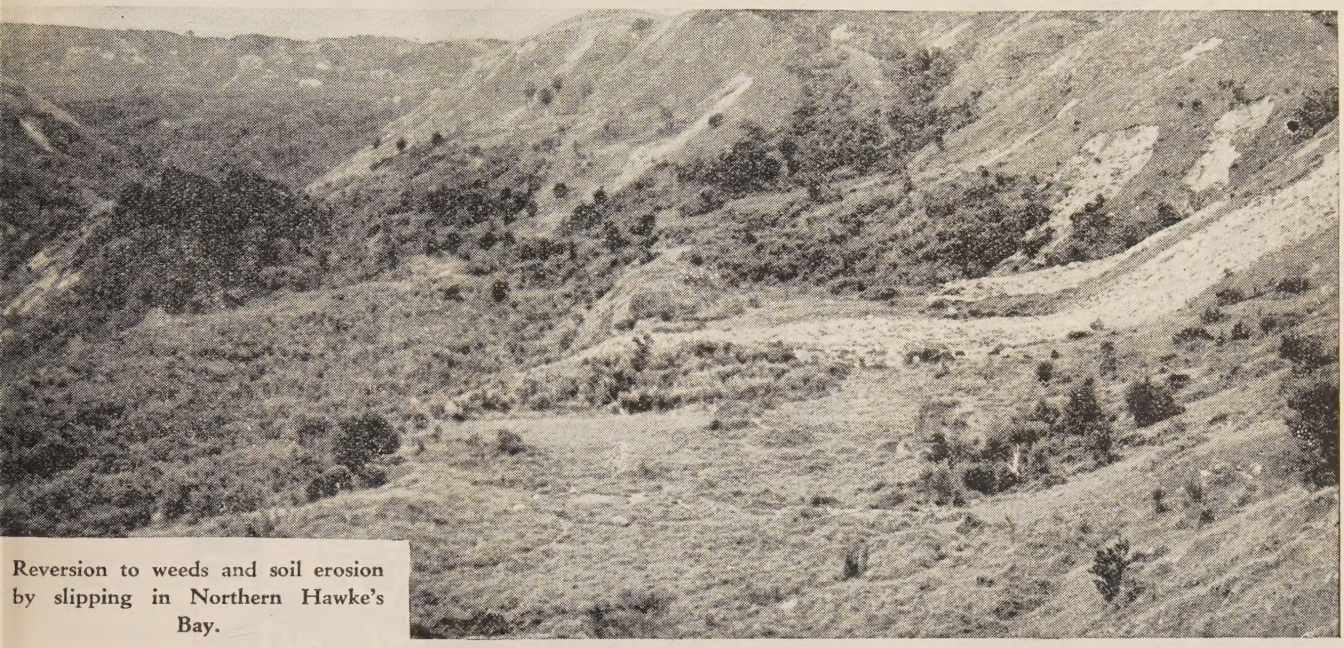
For instance, we have such facts as these: For the last three completed killing seasons the number of fat lambs killed for export averaged in excess of nine millions a year, whereas never previously did the number reach nine millions in a year, and twelve years ago, in the 1925-26 season, the number of fat lambs killed for export in one year reached the five million mark for the first time.

Again, the year 1938 created history in our sheep farming in that it marks the first occasion on which our total flocks numbered more than 30 millions for three successive years. The only other occasion on which the flocks numbered more than 30 millions was in 1930.

Statistics Misleading

All these facts may seem to point to an industry on a sound and strong foundation. Unfortunately, however, the position is that deterioration is rife in parts of our sheep farming land, but it does not appear so in statistics relative to the whole industry because it is cancelled and masked

Phase Of Our National Economy"



Reversion to weeds and soil erosion by slipping in Northern Hawke's Bay.

by improvements taking place in other parts of our sheep farming land. In short, in respect to production our sheep industry is mottled; it is bright in parts and dark in parts.

In this article an endeavour is made to outline the problem. The question of its solution is scarcely discussed. Actually it does not admit of any but incomplete treatment corresponding with our incomplete knowledge of what is the solution.

That the position in respect to our deteriorated land is far from simple follows from the fact that we are faced with at least five major types of deterioration.

Our Worst Weeds

In the first place there is the deterioration due to vegetation which is valuable as stock feed being replaced wholly or largely by vegetation worthless as a source of stock feed. Such deterioration has been very extensive in the past. It justifies assessing as our worst weeds, not the weeds which we hear most about, such as blackberry, but those which do not receive so much mention, such as bracken fern.

If the control of bracken fern were so thorough as to lead to its eradication the advance would be greater than a similar achievement with blackberry. Similar to bracken fern in the role of really bad weeds are tea-tree, hard-fern, water-fern, bidi bidi, and other secondary growth, while ragwort, blackberry and the thistle family are of considerable moment as agents leading to lowered production.

According to official statistics, during eight years ending 1925, approximately 1,100,000 acres had reverted to such worthless plants. It is considered that an equal further acreage has similarly reverted since 1925, and that the sowing to grass of virgin land and the counter-attacks by way of clearing such weeds has not balanced the loss due to their inroads. This belief is supported by the fact that the area in cultivation and occupation in 1937 was 407,000 acres less than in 1925, and this despite the fact that a fairly substantial area of virgin land has regularly been sown in pasture.

It seems worth mentioning that the land deterioration due to reversion to fern and other secondary weed-growth is not confined to the land which has completely gone out of occupation, but includes the extensive area on which the carrying capacity has been reduced often substantially by such reversion.

Deteriorated Pastures

In the second place there is deterioration due to vegetation of superior value as stock feed being replaced by vegetation of inferior value.

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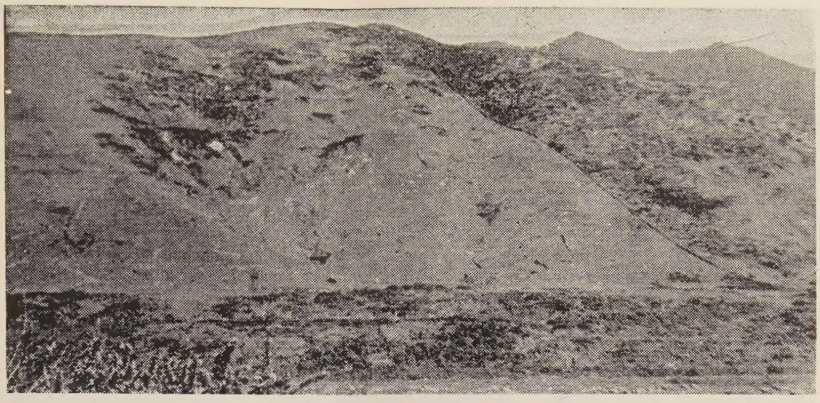


Hill country in the Marlborough district which has been cleared of bush and sown down in grass. On the left the pasture is being held by proper grazing and topdressing. On the right, secondary growth (due to mismanagement) is appearing.

[R. B. Tennent, photo.

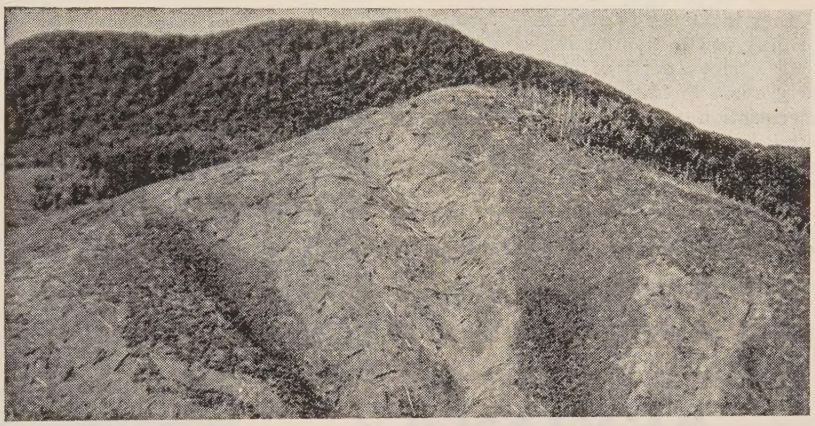
An important and typical instance of this is the development of pure browntop swards on the foothill country of Canterbury, where mixtures consisting of ryegrass, clovers, and cocksfoot were sown originally. Other important instances are the replacement of English grasses by browntop and danthonia, respectively, according to circumstances, on much of the hill grasslands of the North Island.

Undoubtedly at times the most economic course is to accept the browntop-dominant or danthonia-dominant swards as the basis of farming, but at other times it is clear that such swards represent deterioration avoidable by financially attractive measures.

Thirdly, deterioration has at times culminated in depletion of grassland. While some special knowledge and experience may at times be needed to detect deterioration, depletion is self-evident because it involves the more or less complete destruction of all the grass covering. Hence in severe cases of depletion actual bare soil is a main feature of the country. For instance, in Central Otago considerable stretches of the countryside that were originally typical montane tussock-land are now virtual desert. The same is true of areas in the Mackenzie Country, the Upper Waitaki, and the Clarence and Awatere Valleys.

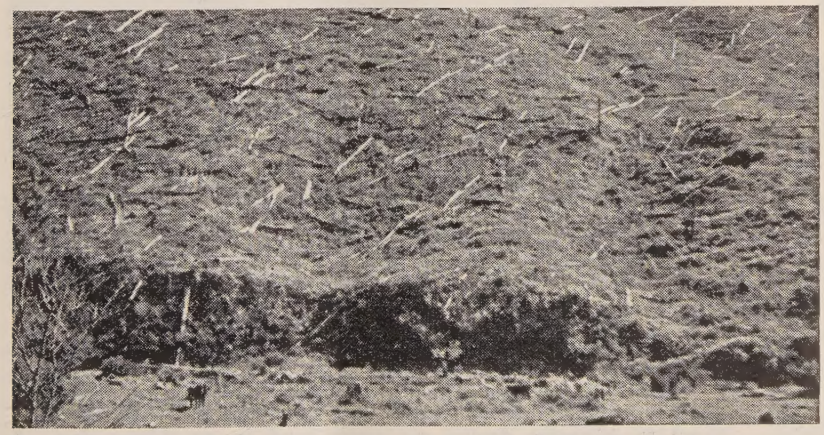
Soil Removal

A fourth form of deterioration, which is worse than the depletion just described, differs from it in that the soil has been removed, whereas in depletion the plant covering has been destroyed but the soil or at least most of it remains. Removal of soil is much in evidence to-day on the hill country landscapes of mid-Hawke's Bay and northern Hawke's Bay. Soils have also been removed over extensive areas in the North Auckland and Coromandel districts.



Bush country which has been felled and burnt but not sown, showing secondary growth taking charge (Marlborough). The treatment of such country in this way is an economic waste.

[R. B. Tennent, photo.



Fern predominates where bush once reigned supreme (Marlborough). This is the result of not adopting proper methods after the destruction of the forest.

[R. B. Tennent, photo.

In the South Island serious soil removal has been taking place and continues to take place on the high-country sheep farming land. While soil removal is due primarily to the action of water and wind or of both, it is facilitated and accelerated by the weakening or removal of the plant covering, so that at times soil removal is basically an advanced stage of depletion.

However, at other times, this is not so, a case in point being the hill country soil removal which recently brought such disastrous results in Esk Valley in Hawke's Bay. In the special circumstances of this case the vegetative covering of the hillsides was not

at all notably weak, and even had a rational programme of soil protection been in operation previously for many years the result would not have been materially different.

Burial of Soil

A fifth type of land deterioration which occurs in many parts of New Zealand is due to the burial of good soil by sand, gravel, and other rock fragments. Frequently the individual instances of such deterioration are not impressive, but in the aggregate the damage thus caused to our farming land is substantial. The most spectacular current example of such deterioration has been the deposition of relatively low-fertility hillside material to a considerable depth over the highly fertile soils of beautiful Esk Valley.

Other instances of such deterioration are provided in the moving sand dunes along various parts of our coast. But the gravest incidence of this class of deterioration undoubtedly is to be found in the downward-moving rock debris of the high country sheep lands of the South Island.

Only a few lone tussocks remain where luxuriant native vegetation once grew (Central Otago). Scab weed and worthless plants dominate the land.

Causes of Erosion

From the foregoing analysis of the position it is clear that one of the serious causes of deterioration is soil erosion, which often is influenced by various farm practices. One of these is the removal of the natural vegetation from slopes by fire for the purpose of establishing pastures or of improving their immediate feeding value. Another is the establishment of pastures which are unsuitable to the conditions and do not provide a permanent close vegetative cover of the ground. Still another is injudicious

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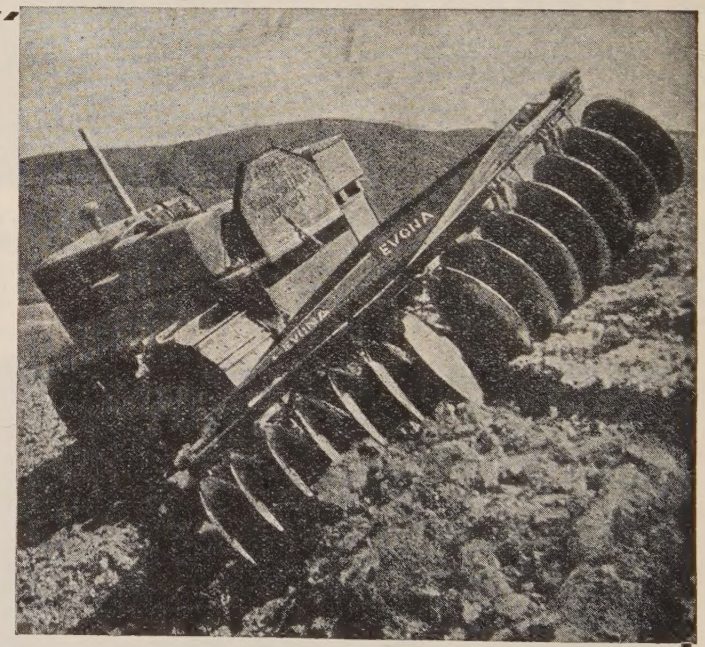

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stocking, and particularly overstocking, which may be due in part at least to failure to suppress rabbits effectively.

At other times soil erosion enters into the matter but slightly if at all, the deterioration being due basically to the coming in of inferior plants.

The deterioration of the high country sheep farming areas of the South Island is noteworthy in that it involves all the five major types of land deterioration which have just been discussed. Hence, the checking or prevention of deterioration of this high country is a particularly complicated matter.

Rabbits, burning and overstocking have ruined the tussocks (Central Otago). Scab weed and hair grass are now interspersed between the fescue tussocks, and the carrying capacity is reduced to a minimum.

Major Problem

Associated with this is the fact that a major farming problem of the South Island is the determination of the best method of using the high country pastoral lands of the South Island. As evidence of this, it is sufficient to say that somewhat more than half the total occupied area of the South Island is in tussock, that the bulk of the tussock is in the high country under consideration, and that authorities are in general agreement that the tussock country is a steadily depreciating national asset.

Due to mismanagement, the tussock has disappeared. Inherently fertile, the country is now barren, being largely covered with scab weed.

Included in the high country pastoral lands is the montane tussock grassland, which comprises an area of more than six million acres, and which stretches in an almost unbroken belt from the Wairau River in Marlborough to the mountains of Southland. This belt has been grazed continuously for almost eighty years, during which very little of consequence has been done to improve or maintain the productive capacity of the land.

In fact the general tendency of its treatment during the whole of that time has been to give an adverse result. The present farming position of much of the montane tussock-grassland is unsatisfactory, but it seems reasonable to expect that means of improving it can be found. Indeed, they may be in use now on certain runs in the belt.

Position Worsening

For convenience of consideration the land subject to deterioration may be subjected to another grouping giving two classes:—

Firstly, there is the land which is in process of deterioration, but which still contributes substantially to our production. The general opinion is that deterioration of much of this type of land is becoming progressively more rapid, and this certainly seems true of

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large parts of the high country sheep lands of the South Island, of extensive parts of Northern Hawke's Bay, and of the Auckland district, and of parts of the Wellington province. A substantial achievement would be to check the deterioration that is in progress. If suitable steps are not taken we are faced, not merely with an unsatisfactory position, but with an unsatisfactory one which is steadily becoming worse.

Field experience shows that under certain conditions it is a relatively simple matter, not only to check deterioration in a manner which is economic, but also to increase production substantially by profitable measures. At other times we know farming measures which will check deterioration, but there is not conclusive evidence whether such measures would be profitable to the individual. Then, again, at other times it seems doubtful whether any farming measures will satisfactorily check the deterioration, and the question immediately arises whether farming of such land should be discontinued.

Out of Production

Secondly, there is the land which once was farmed but which has deteriorated so much as to be no longer in production. Though probably this land has attracted more public attention, it is nationally less important than the previously mentioned class. Certainly some of this land can be brought back into production; in fact, this has already been done. But whether in such cases such action proves profitable over a range of years under normal farming conditions seems not always to have been established.

Further, some of this land should be left out of farming permanently, either because of the soil erosion that inevitably would be associated with economic farm use of the land, or because of the difficulty of controlling scrub and other weed growth in climates of heavy rainfall.

Soil erosion in high hill country in the interior of mid-Hawke's Bay.

Not New Development

While it is decidedly fitting and useful to have attention directed to land deterioration as a serious phase of our national economy, it is well at this juncture to make it clear that the land deterioration which is causing so much concern is not a development which suddenly has come upon us unawares.

As evidence of this mention of two facts must suffice. In 1920, with the object of ascertaining the position in respect to the high country pastoral lands of the South Island, a commission was appointed by the Government of that time. Again in 1925 a special committee was appointed by the Government to investigate the deterioration of certain land in the Auckland, Taranaki, and Wellington districts.

The deterioration which concerns us today is the same type as that which gave concern in those days. Though

A panorama of rolling country in Hawke's Bay showing invasion by scrubby weeds. This can often be profitably remedied.

the position may be, and probably is, more acute now, it is not radically different from what it was then.

The Alarmist Attitude

The consideration of the whole circumstances over a period of time will tend to a proper discounting of the alarmist attitude in respect to land deterioration which at times recently has been in evidence. Let it be made quite clear that discounting the alarmist attitude is not the equivalent of denying that urgent attention should be given to land deterioration. Actually, the sooner land deterioration receives proper attention the better. But if an alarmist attitude prevails there is always danger of hasty action not founded upon proper knowledge.

From some of the foregoing remarks it will be realised that our knowledge of how to deal in an economic manner with certain phases of land deterioration is far from complete. The proper foundation for any course of action lies in obtaining more complete knowledge. The position is complicated by the fact that in considering land utilisation it at times becomes necessary to differentiate between what is economic to the State and what is economic to the individual. From this it follows that the most effective handling of land deterioration may at times necessitate State action along lines which would be impracticable to the individual.

Investigations Made

Over a period of many years several phases of land deterioration have been the subject of investigation by the Department of Agriculture. The principal objective has been to ascertain both how to remedy deterioration and how to improve the productive capacity. The work has included an intensive investigation on the Whangamomona district relative to regrassing under heavy rainfall conditions. In this particular attention was paid to pasture seed mixtures, topdressing, and weed control. Over many years in several districts manuring of hill country grassland has been investigated, and is being investigated at present, especially in Hawke's Bay.

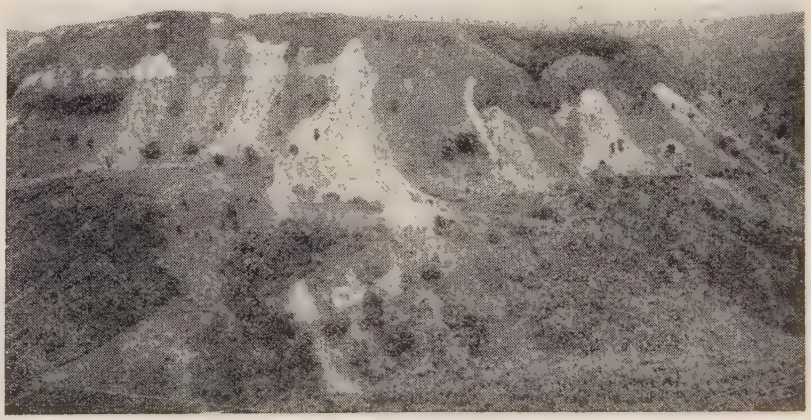
The provision of winter feed, particularly in relation to the running of cattle as pasture management agents, is now being investigated, with special attention to the potential role of pampas grass.

The role of surface-sown subterranean clover in hill country farming is being investigated, as also is the establishment of other clovers and kindred plants. Particular importance is attached to clovers in hill country farming, because it is expected that often the presence or absence of thriving clovers determines whether or not phosphatic topdressing proves financially attractive.

On the South Island montane tussock grassland the experimental surface-sowing of a wide range of plants of possible value under the conditions was carried out.

Other matters that are now receiving attention are the eradication of ringfern and the control of soil erosion.

It is fully recognised that this is an incomplete programme of research. Nevertheless, it is felt that a solution



Another view of soil erosion in high hill country in Hawke's Bay.

of the problems being studied would place us in a much stronger position.

Further investigations involving particular attention to the economics of hill country sheep farming are being planned, and it is expected that these soon will be initiated.

Position Summarised

The position under review may be summed up as follows:—

Land deterioration is a grave phase of our national economy.

It is extensive in its scope and far-reaching in its influence. It affects principally hill country sheep farming, and sheep farming devoted to fat lamb production is directly interlocked with our hill country sheep farming. Hence, the welfare of hill country sheep farming will be reflected in our fat lamb industry.

Land deterioration is complicated in respect to its causes, and it is to be expected that the remedy for it at times will prove difficult and costly.

It is highly desirable that without delay attention be given to major phases of land deterioration, and, as a rule, the greater the delay the more difficult will be the position. On the other hand, hasty action originating in an alarmist attitude of mind and not based on adequate knowledge needs to be avoided.

Two forms of deterioration on Hawke's Bay hill country—soil erosion and blackberry invasion.

History teaches that land deterioration is not to be treated lightly. One instance of this must suffice: "Once Antioch, with its population of over three-quarters of a million, was one of the great cities of the world; today, buried some 20 feet in desert sand, it has a population of 30,000, who are in poverty and in the ruins of a glorious past."

While it cannot be said that such a fate for New Zealand is in prospect, the position is far from agreeable.

Unless otherwise specified, the photographs illustrating this article were taken by H. Drake, Palmerston North.

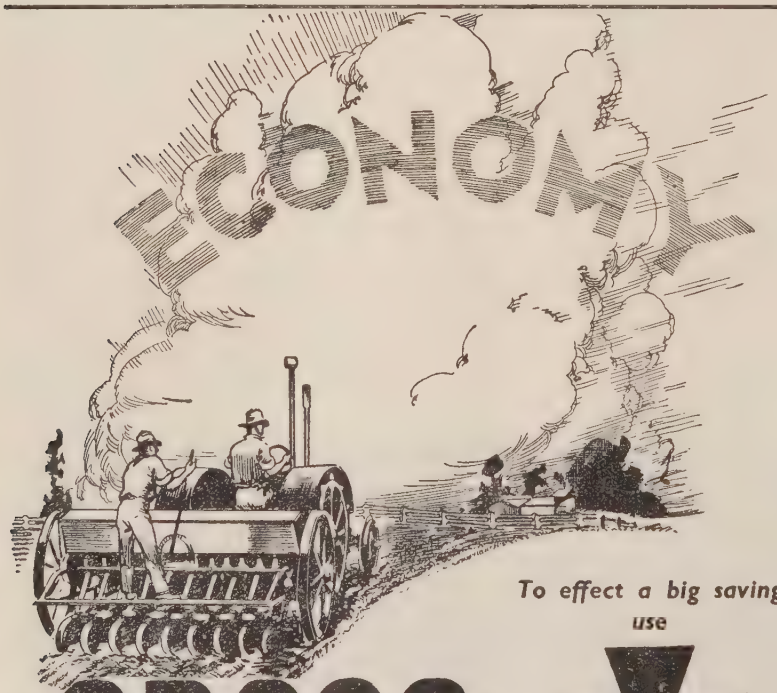


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Fig. 1.—Views of Wairarapa East Coast hill country. Considerable variation in steepness and accessibility occurs.

Arresting Deterioration Of Hill Country

Improved System Of Grazing Management Is An Essential Preliminary

N. LAMONT, Instructor in Agriculture, Masterton.

MUCH has been written in the past few years on the problem of hill country deterioration, its causes, and the possibilities of economic restoration. Without going into what would necessarily be a lengthy consideration of the various factors involved, it is proposed in this article briefly to sketch the importance of grazing management in relation to hill country pasture production and quality.

All are familiar with the spectacular results achieved by such men as Mr. Phillips, of Marton, but few would appear to appreciate the fact that the same principles that enable him to winter nine or ten ewes per acre can be applied to less fertile country with every expectation of results appropriate to the type of country. The principle of intermittent grazing of pasture, whether practised under a definite rotational grazing scheme or not, must unquestionably be regarded as the essential preliminary to all other improvement schemes for hill country.

A system of grazing management involving large mobs and frequent shifts, with heavy concentration of stock in each paddock for a short time, must be employed by hill country farmers who wish to arrest deterioration. Other economic methods of improvement are also available, but improved grazing technique is an essential preliminary.

Many are now satisfied that hill country topdressing will pay, but how much more will it pay when practised in conjunction with a grazing technique that encourages species responsive to topdressing? Good results have been obtained from the introduction of subterranean clover into hill country pastures, but how much better would be the returns if grazing were such as to exploit more fully the potentialities of this plant?

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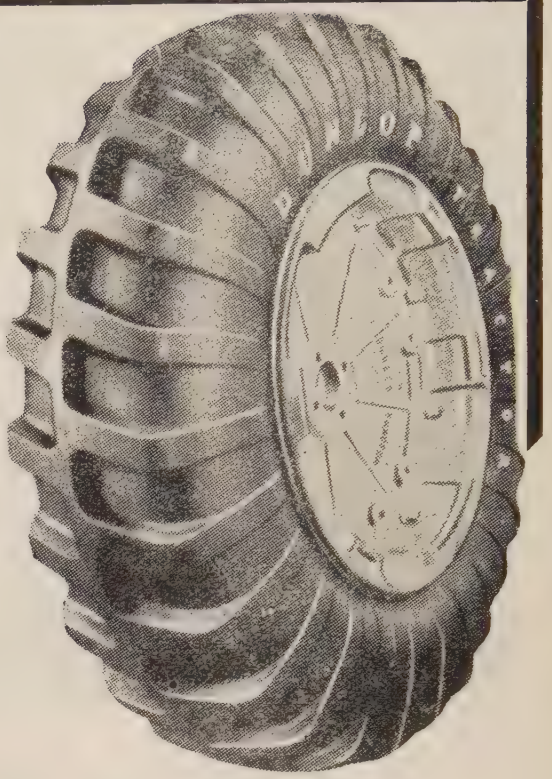

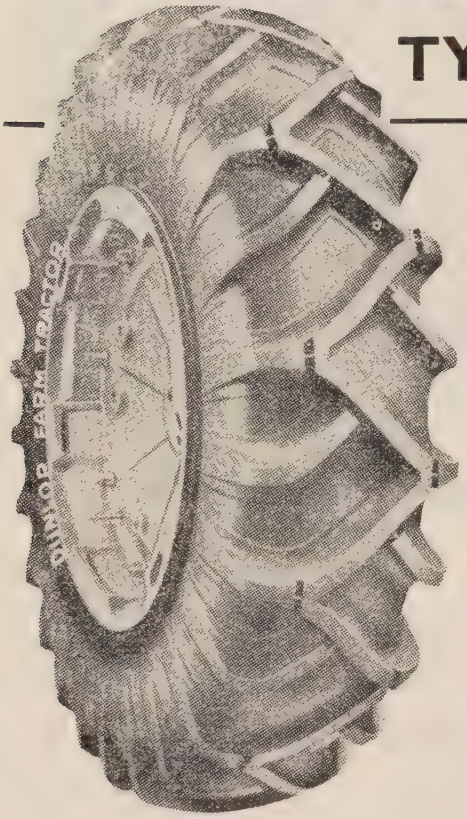

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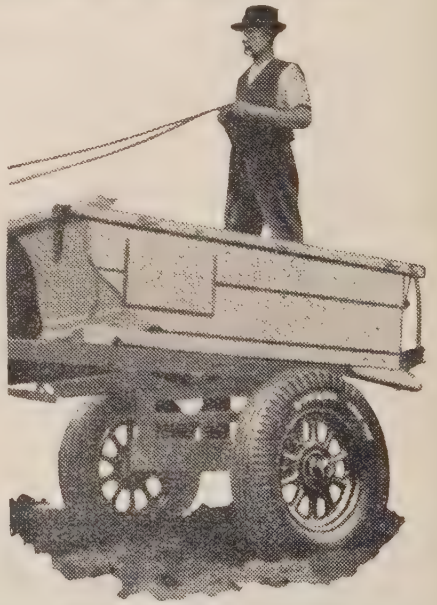

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Fig. 2.—(a) Papa country, which so readily slips, can make even packing difficult. (b) The work of topdressing is barely begun when the manure is dumped in the paddock, although the heaviest expense is passed. (c) Uneven grazing means waste in two ways—waste due to neglected tufts and, usually, waste due to overgrazing of spaces between tufts when trying to force stock to clean them up.

Fundamental Principles

To many, the thought of rotational grazing on hill country raises a disturbing mental picture of expensive fencing. In very many cases, however, little or no fencing is required, and striking results can be expected on any property by applying certain fundamental grazing principles. It is intended, therefore, to consider briefly these principles, because by understanding them any farmer can readily convert principle into practice with the aid of intimate knowledge of his own property.

It is unfortunately true that very many hill country farmers have yet to appreciate the function of leaves in the life of a pasture plant, and to realise that in allowing stock to remove those leaves there is a vast difference between skilful exploitation and continual punishment of a plant.

In appreciating the fact that leaves are an essential part of a plant's anatomy and in showing a little more consideration for the plant's requirements, one has, in a nutshell, the principle of rotational grazing. If any encouragement is needed to read this article past this point let it be remembered that improved grazing management, unlike topdressing and subterranean clover, is costless. The principles involved are as follows:—

Frequency of Cutting

(a) **Grazing in Relation to Production.**—Whatever the component species of a pasture, be they "English" or "native," two factors must be recognised in order to obtain maximum potential production. These are:—First, that the leaf blade is an essential part of the plant's anatomy, without which the roots cannot thrive for very long; and, secondly, that the leaf stem between the blade and the crown of the plant is an important plant food storage region. The practical application of these points has been frequently demonstrated in experiments on the effect of different frequencies of grazing and of different intensities of grazing.

Experiments on the effect of frequency of cutting on the total production of a pasture have invariably shown that when pastures are cut at intervals of less than a month the total production is reduced as the frequency of cutting is increased. Thus, weekly cutting gives a lower total production than fortnightly cutting, and so on. Further, the speed of recovery is directly affected by the closeness of cutting. Very close cutting results in an appreciably slower recovery than from less severe cuts, the rate of recovery generally being quickest when the cutting is least severe.

Length of Pasture

(b) **Grazing in Relation to Efficient Utilisation.**—The waste that occurs when pastures become overgrown, wholly or in patches, is thoroughly appreciated, and little more need be said about this aspect. One feels, however, that undue emphasis has been laid on the admonition to keep pastures at the "short, nutritious stage," with unfortunate consequences both to the health of stock and pasture. By all means, do not permit long, rank, or dry growth, but do not achieve this by continuous grazing—rather by heavy stock concentration for short periods. Further, a ruminant animal is adapted for the handling of fibrous feed, and excessively succulent, watery pasture cannot but lead to digestive disturbances.

Pasture Components

(c) **Grazing in Relation to Pasture Components.**—It is common knowledge that certain pasture species thrive under "slack" grazing, while others dominate a closely-grazed sward. The dominance of cocksfoot in fenced shelter belts is one illustration of this principle. It is, however, probably not so widely realised that intensity of grazing at different seasons of the year can also alter the species composition of pasture.

For instance, seed growers fully understand that light grazing in late winter and spring, followed by early closing up, will give them a ryegrass dominant seed crop, whereas the same area could grow a white clover seed crop if grazed closely throughout the early spring and closed up later. The explanation of this is to be found in what can be called the "dominant growth" periods of different species.

In the above case it is well known that ryegrass commences growth earlier in the spring than white clover, so that by encouraging pasture growth early in the spring we encourage the species making the dominant growth at that period (i.e., ryegrass), while by suppressing early growth and encouraging later growth we encourage white clover, whose dominant growth period is later.

It should hardly be necessary to point out the application of this principle to hill country, where the pastures are invariably punished severely during winter and the early spring—the dominant growth period of ryegrass—and lightly grazed in relation to pasture growth later in the spring, when the later "native" grasses are making their bid for dominance in the sward.

Erosion

(d) **Grazing and Erosion.**—Although some fertility has been removed from hill country in the form of meat and wool, there is no question that "sheet erosion" has been, and still is, the most important single factor which is responsible for the reduced fertility of hill country. Neither is there any question that over-grazed open swards are a most important factor contributing to this form of erosion.

As commonly practised on so much of our hill country, grazing closely and continuously during winter and early spring results in the exposure of the ground surface to the eroding influence of running or wind-driven water. Further, the restricted root development of pasture plants under these grazing methods further accentuates the trouble.

Intermittent Grazing

Intermittent as Opposed to Continuous Grazing.—A thorough examination of the whole question of hill country grazing technique would fill a fair-sized book, but the four points briefly treated above should serve to make clear the importance of a system of grazing whereby each particular paddock is spelled periodically, and, when it is grazed, is "cleaned up" as quickly as possible.

The steepness of the country, the large and varying size of paddocks, and the presence of mixed-aged sheep make a "rule of thumb" rotational

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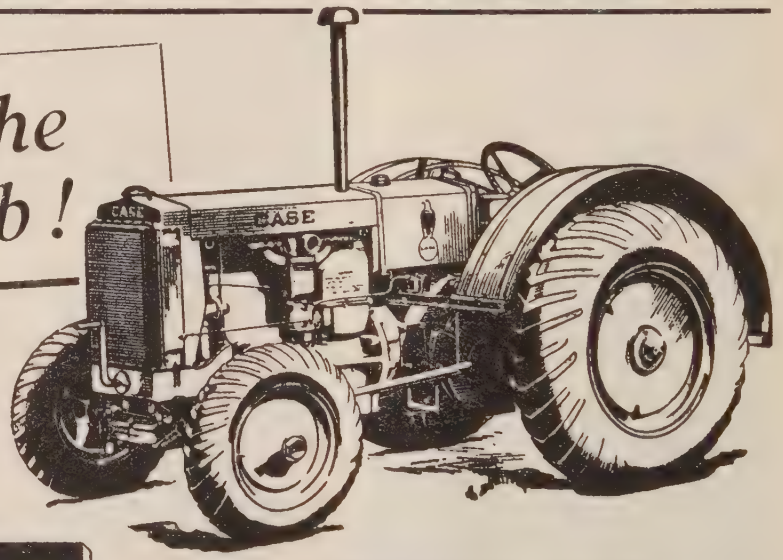

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grazing scheme a more difficult proposition to the hill country farmer than it is to the fat lamb producer on easier country.

For that reason, the term "intermittent" grazing (which describes the principle) rather than "rotational" grazing (which describes the practice) has been used, because a great deal can be achieved on hill country by appreciating the principle involved and without the subdivision into even-sized paddocks that a complete rotational system demands.

Already there are hill country farmers who are practising "rotational" grazing whereby their stock in large mobs are regularly rotated over the whole farm, but others are unable to do more than graze paddocks intermittently at and for intervals decided by their special circumstances.

Fig. 3.—(a) The green blades and white stems of the plant's leaves are easily seen in the picture. A plant quickly grazed to a level just above the stems (b) will quickly recover. If grazed below this point (c) recovery is slower and the roots are weakened.

The Rule

Briefly, the rule is—the shorter the feed, the quicker the shift. Little consideration will show that this meets the position fairly well so far as the four points outlined above are concerned, understanding, of course, that to make this possible the stock must be in as few and as large mobs as can be handled conveniently.

The actual length of spell given must vary with the season of the year. During periods of little growth (i.e., winter) three weeks or even a month may be the ideal, whereas one week may be too long in the mid-spring. In other words, the period is determined more by the stage of growth of the pasture than any particular length of time. Of the period of time spent by a mob in one paddock, no more need be said than that it should be as short as possible, down to one day, and it will, in practice, be determined by the time taken by the mob to spread over the paddock and by the number of paddocks in the system.

It is quite impossible to be very explicit with regard to the actual practice of hill country grazing methods, as so much depends on particular circumstances, but in future issues brief outlines of actual cases will be given, which will serve to illustrate what can be done.

Fig. 4.—Some of the poorer country may well be put into trees. These two-year-old pines are a good investment, although the fire risk is ever present.

Summary

A system of grazing management involving big mobs and frequent shifts, with heavy concentration of stock in each paddock for a short time, must be employed by hill country farmers who wish to arrest deterioration. Other economic methods of improvement are also available, but improved grazing technique is an essential preliminary.

Such a system will definitely result in certain benefits.

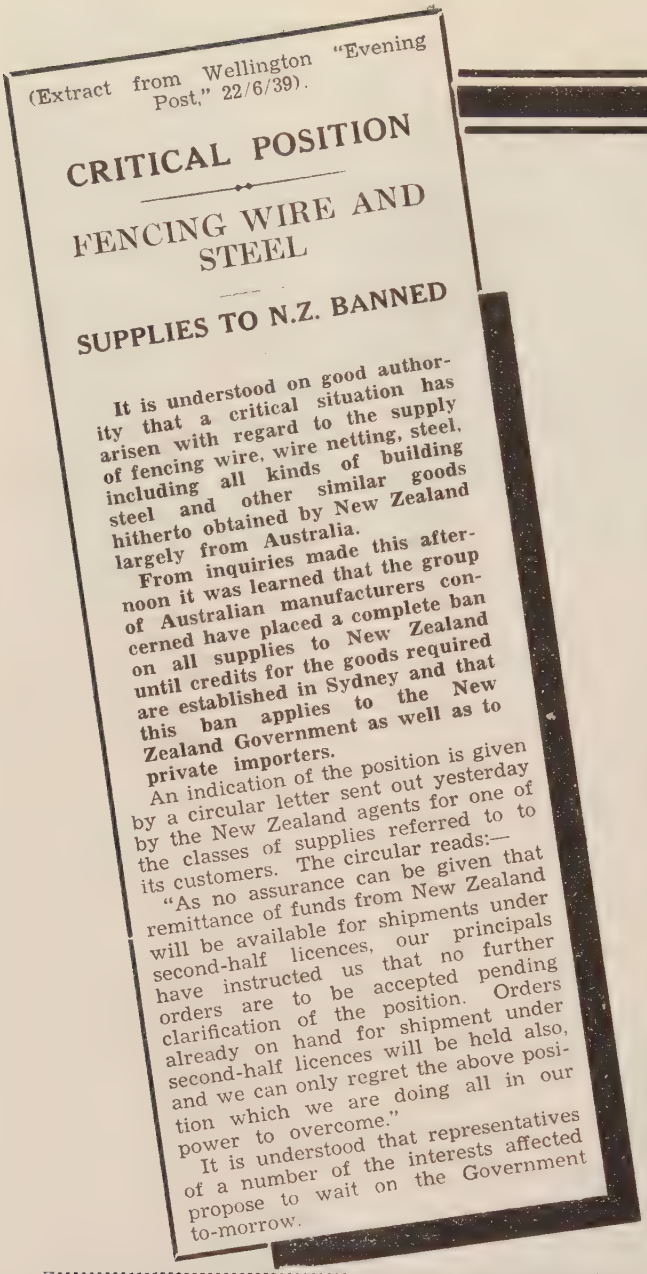
(a) By allowing pasture plants to have undisturbed use of their leaves during the whole period of the spell, production and root development will be improved.

(b) By avoidance of grazing too close to the ground, the quickest recovery from grazing is assured.

(c) By keeping pastures even, feed can be utilised by stock when it is all at the right stage—neither long and coarse nor too short and watery.

(d) Intermittent grazing during winter and early spring will definitely encourage better species of grasses. Those species which attempt to make some growth during these periods will not be penalised, as they are under continuous grazing.

(e) Improved grazing methods directly and indirectly can increase sward density, thereby reducing the ravages of sheet erosion.



(Extract from Wellington "Evening Post," 22/6/39).

CRITICAL POSITION

FENCING WIRE AND STEEL

SUPPLIES TO N.Z. BANNED

It is understood on good authority that a critical situation has arisen with regard to the supply of fencing wire, wire netting, steel, including all kinds of building steel and other similar goods hitherto obtained by New Zealand largely from Australia.

From inquiries made this afternoon it was learned that the group of Australian manufacturers concerned have placed a complete ban on all supplies to New Zealand until credits for the goods required are established in Sydney and that this ban applies to the New Zealand Government as well as to private importers.

An indication of the position is given by a circular letter sent out yesterday by the New Zealand agents for one of the classes of supplies referred to to its customers. The circular reads:—

"As no assurance can be given that remittance of funds from New Zealand will be available for shipments under second-half licences, our principals have instructed us that no further orders are to be accepted pending clarification of the position. Orders already on hand for shipment under second-half licences will be held also, and we can only regret the above position which we are doing all in our power to overcome."

It is understood that representatives of a number of the interests affected propose to wait on the Government to-morrow.

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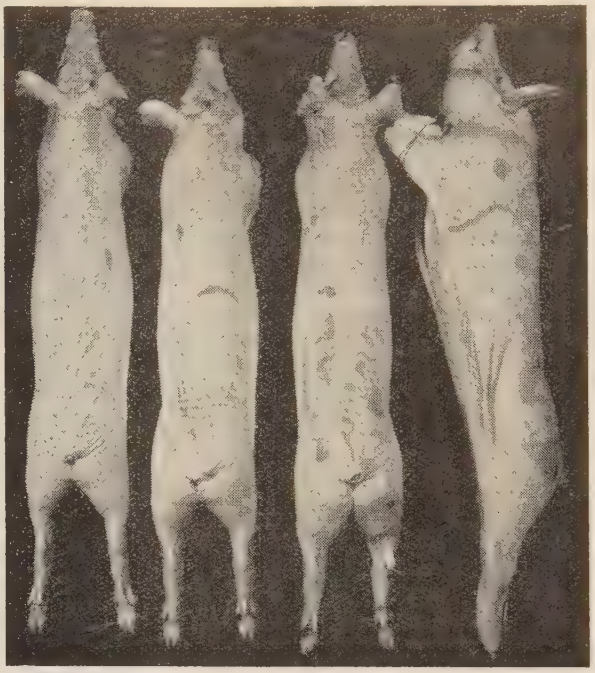
Careless Handling Of Pigs

Bruises And Injuries Can Be Prevented By Simple Precautionary Measures

J. E. McILWAINE, Assistant Director
Livestock Division, Wellington.



Showing damage to pigs' carcasses by whips, feet marks of other pigs in riding sows on heat, and hits and kicks.

IT IS necessary to draw the attention of all people engaged in the handling of pigs to the prevalence of bruises and weals on various parts of the skin of these animals.

Some time ago an appeal was made on similar lines in regard to the handling of lambs and sheep in order to avoid bruises and superficial blemishes. The position in regard to pigs is of equal importance, as many animals arrive for slaughter in a marked and bruised condition.

The economic aspect of the matter should appeal to all concerned. Farmers, dealers, and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of otherwise prime porker and baconer carcasses, whether intended for local curing or for export overseas.

Pigs show superficial marks after slaughter more readily than other classes of animals, but to some extent the amount of superficial marking can be reduced by resting the pigs for a period of up to 36 hours before slaughter. It has been shown that this practice also improves the curability of the carcass, but quite apart from this it definitely tends to tone down the effects of bruises and skin marks, and is a practice that can be recommended for the consideration of slaughterhouses.

> **Concern is felt in many quarters at the prevalence of bruises and weals on various parts of the skin of pigs. Farmers, dealers and carriers should do their utmost to avoid causing skin blemishes, which may bring about the degrading of otherwise prime porker and baconer carcasses. Much can be done by a little more care and patience, the use of a proper yard and loading race, and the absolute prohibition of rough handling, stock whips and sticks.**

Appeal Made

In many cases it is difficult to know the actual culprit when pigs pass through saleyards and various carrying agents. Hence, an appeal must be made to all concerned. It should be realised that the handling of pigs is a tedious business, and plenty of time should be allowed for carrying out the work in each case. It is desirable that the position should be very considerably improved, and everyone should share the responsibility of bringing about an improvement.

The farmer-producer can do his part by carefully loading and unloading his pigs when he takes them to the saleyards or to the works. He can assist the carrier in loading pigs at the farm and impress upon him the need for careful handling in transport.

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Here it is important to note the assistance to be obtained by the provision of a simple yard and loading race. Such a facility will do much to assist careful and efficient handling and loading at the farm. The amount of time wasted in trying to hunt pigs from one place to another with sticks is as nothing compared with the damage which is done to tempers and nerves and to those of the hunters.

This trouble is often seen at its worst on the farm where no loading facilities are available for the convenient despatch of pigs to the works. A number of people and dogs are seen attempting to catch pigs in the paddock, the pigs being eventually hunted to a standstill, when they are caught and literally carried one by one into the waiting lorry. A fevered condition is thus set up, and a good deal of unnecessary bruising results from this method of loading. Because of the great importance attached to this aspect of the matter, sketches and diagrams of suitable loading races are published with this article.

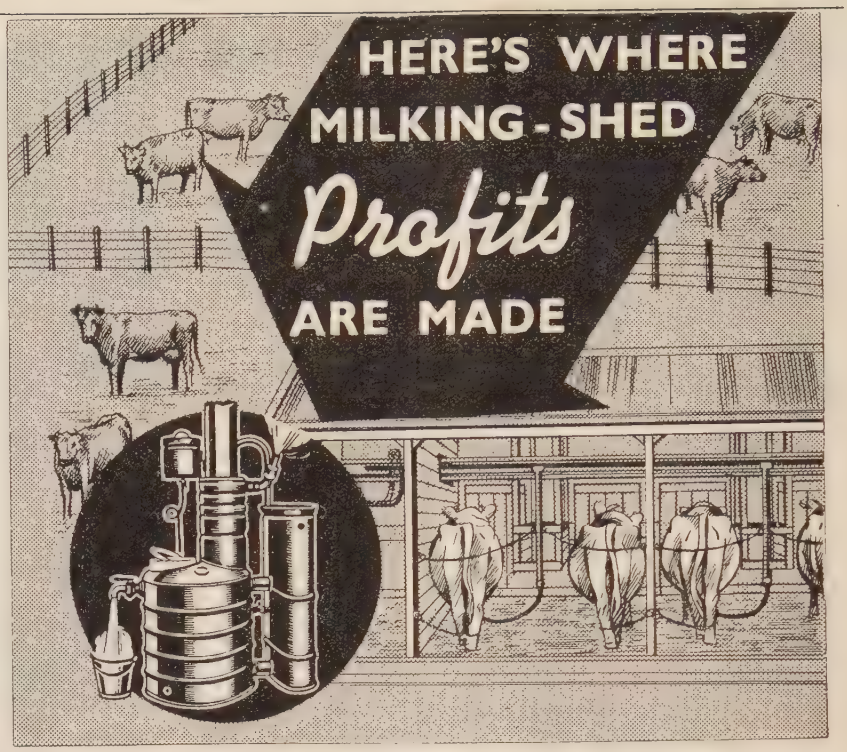
Lifting Pigs

In cases where it is necessary to lift pigs the correct method of securing a pig is to seize a hind leg and not to depend on the ears or tail. If porker pigs are being dealt with the near hind leg is seized firmly below the hock with the right hand, and the left hand and fore-arm are then placed underneath the breast behind the forelegs. The pig can be lifted and carried in this way without bruising. Heavier pigs will require to be lifted by locking both arms around the chest behind the forelegs.

A careful system of handling pigs should be followed in all cases. There is a certain amount of unavoidable bruising which will continue to be a source of loss. When pigs come on heat in transit they generally get badly scarred and bruised over the loins and back by the feet of other pigs in the truck. Such bruising is unavoidable or impracticable to control.

Damage by Carriers

Carriers who habitually deliver bruised and marked pigs at the works or rail should be warned and cautioned, as such injuries are reflected in the grading sheet returned to the farmer. As far as possible, the carrier's trucks and railway trucks should be loaded with pigs of the same class —porkers with porkers, baconers with baconers, and choppers separately.



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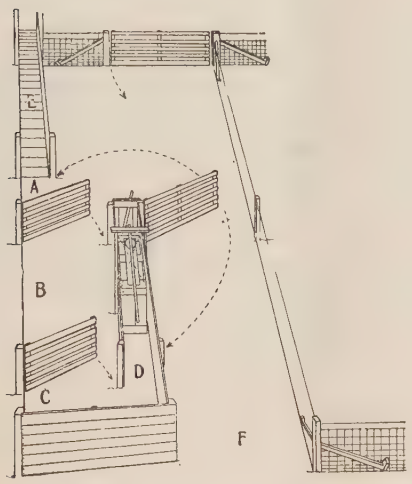
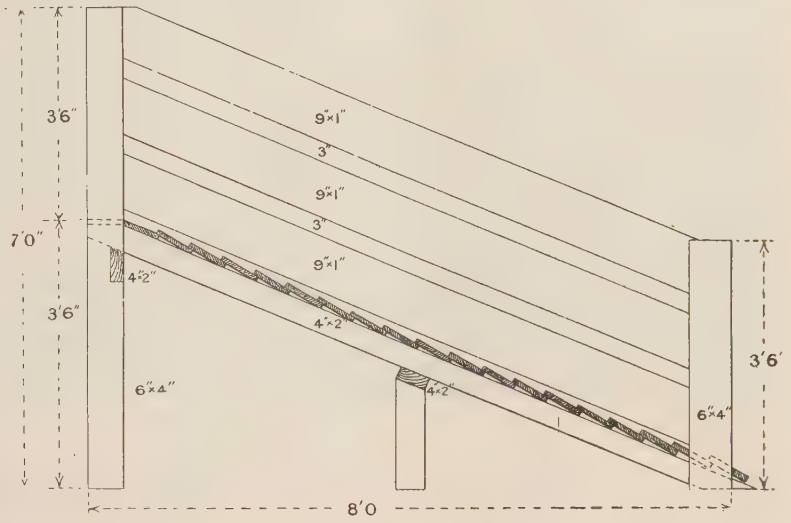


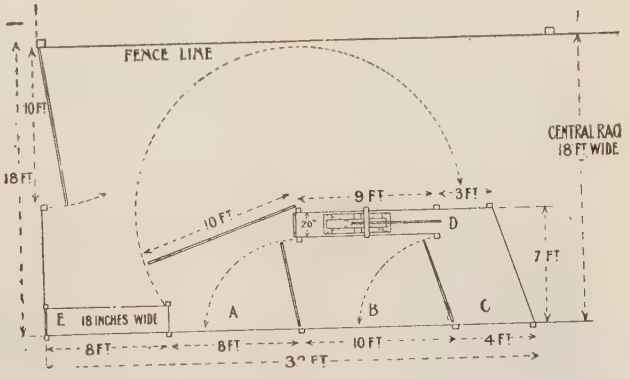
LOADING RACE



Timber Required and Costs.

	Running ft.	
Uprights for race	21 ft.	6 x 4
Pillows and ramp joists	24 ft.	4 x 2
Side of race	54 ft.	9 x 1
Ramp of race	30 ft.	6 x 1

Ground and Perspective Plan of Loading, Grading and Weighing Yards.



A. Receiving Yard.
B. Holding Pen.
C. Grading Pen.
D. Weighing Race.
E. Loading Race.
F. Central Race.

The 10ft. gate hinged to the front corner of the weighing race swings as indicated by the arrows. When pigs are brought into the yard from the central race F., they have a clear view through the end gate and fence and readily enter the receiving yard A. By closing the gate from the weighing race to the loading race there is no possibility of the pigs escaping as they begin to find themselves confined in the yard A.

All walls and gates are 3ft. 3in. high of 6 x 1, 9 x 1 or 12 x 1 boards, which should not be spaced more than 3in. apart.

Obviously marked or bruised pigs should be well rested before slaughter. At the works careful untrucking is necessary, and care is necessary in driving the pigs into the holding pens and up the race to the sticking pens.

It is surprising how an apparently innocent-looking mark on the live animal shows up when the pig has been scalded and cleaned. These marks become still more accentuated when the carcass has been hanging for some hours in the cooling-room. It is possible for the inspector to give the carcass the benefit of the doubt at the time of inspection and for extensive markings to show up when the carcass has been chilled.

Few people seem to realise how easy it is to raise a weal on the back, loins, and hindquarters of pigs. The thicker skin of the head and neck is not easily marked, but generally speaking the pig is very susceptible to skin blemishes and weals.

Cause of Blemishes

How are these blemishes caused?

It appears from the very nature of the reddened weals that the majority are caused through the use of stock whips, fine sticks, and even dog bites. Occasionally those about the head and neck are caused through the pigs fighting among themselves in the trucks.

The larger, more diffuse bruises are apparently caused through kicking and pushing and general rough handling in and out of trucks. In exceptional cases a stag or rig pig placed unknowingly in a truck with other pigs can do immense damage. In this case, the tendency is to produce actual flesh wounds, gashes due to the tusks, rather than bruises or weals. In the latter case the farmer must be blamed for allowing a stag to be trucked with other pigs.

A very great amount of this injury could be avoided if reasonable care and co-operation were forthcoming. In the first place, the use of stock whips should be absolutely prohibited in the

driving or loading of pigs. The use of sticks should be confined to the least vulnerable and least valuable parts of the pig.

Sticks and Stock Whips

It should be recognised in the pig world that the only parts which cannot be seriously injured by sticks are below the hocks on the hind legs and the snout in front. In fact, a broad lash made from a piece of old cycle or car tube would serve a more useful purpose than sticks. All kicking, rough handling, and biting dogs should be prohibited.

It is true that the pig is considered a most obstinate animal, and it is said that it frequently takes the opposite direction to that desired. At the same time, the use of proper loading races or banks and the exercise of patience, with permissible persuasion on the parts already indicated, will do much to eliminate this as a cause of degrading of carcasses.

Considerable progress has been made in raising the standard of pig husbandry in recent years, resulting in a reduction of castration abscesses, pleurisy, and other septic conditions. It is hoped that this progress will continue, but some of this good work will be nullified if unnecessary bruising and marking still persist.

Complaints From Overseas

There have been complaints from overseas in regard to the skin marks, blemishes, and weals seen on New Zealand pigs in the Home markets. It appears that marked pigs are not desired by the trade even though they are in a lower grade and can be purchased at a cheaper price. Weals and skin marks are also a distinct reflection on our careless methods of handling the live animals. No amount of scalding, scraping, singeing, and dressing can remove some of the marks, and in some works singeing is not possible and porkers are not singed as a general rule.

As the matter can be rectified with the exercise of a little more care and patience, the co-operation of all those engaged in the handling of pigs is much to be desired in the interests of the industry as a whole.

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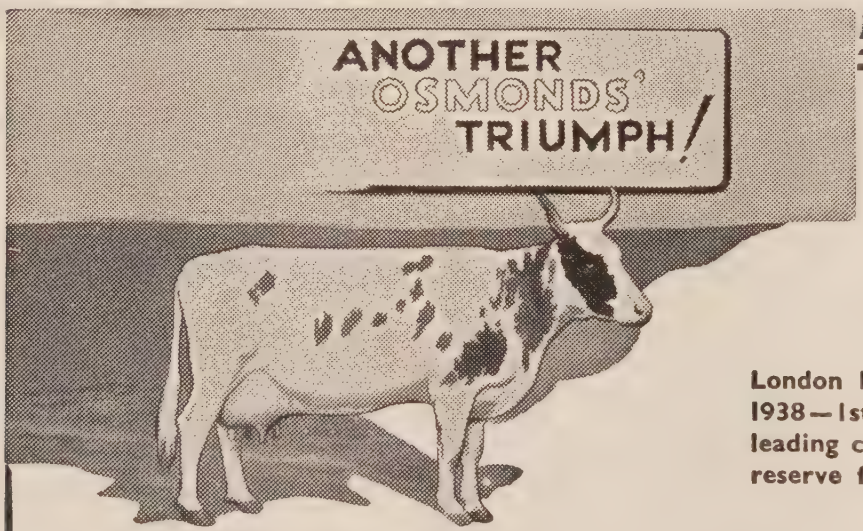

One of Osmonds' Netherwood herd of Ayrshire cows, "BROOMLANDS BLOOM" (40605)

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A striking comparison of topdressed and untopdressed pasture under irrigation.

Topdressing Irrigated Pastures

Extension of Practice in Central Otago Will Result in Substantially Improved Pastures

W. R. LOBB, Instructor in Agriculture, Ranfurly.

WITH the increase of irrigation in New Zealand, farmers will be expecting economic increases in production from the use of water. Irrigation in Central Otago has been carried on for some years now, and several important factors are becoming apparent which are of interest to those who have used water and also to those who may have the opportunity to use water in the future.

The very low annual rainfall experienced in Central Otago has made water the limiting factor, not only for increased production, but also for the maintenance of the pasture. During a dry summer most of the clovers and bottom growth of the sward is killed and the remaining grasses are very much weakened. It is then that the value of water is apparent. Not only does its use prevent a serious feed shortage, but it also allows the life of the pastures to be saved and maintained.

A Comparison

The above illustration is of exceptional interest. The pasture shown is on light land broken out of native tussock. Something of the nature of the original cover can be seen by looking more closely into the background. Once this light land is broken from tussock it is most difficult to maintain a pas ture where the rainfall is low.

Irrigation is not enough on many Central Otago pastures, for the palatability and nourishing value of the food produced from unmanured irrigated pastures declines after a period. Topdressing could be more widely adopted with the following advantages: (1) Increased production maintained, (2) Maintenance of good grasses and clovers in the sward, (3) Increased life of the pasture, and (4) Increased palatability of the pasture.

The history of the paddock in the foreground illustrates this. After this land had been broken from tussock almost the only cover that could be obtained was a thick stand of sorrel. In this case it must not be thought that the soil is at all sour in nature because of the sorrel present. Sorrel grows well on much of the light land, not because of the sour conditions, but because the conditions are so dry that nothing else will produce a cover sufficient to prevent sorrel taking a hold.

In point of fact this land is rich in available calcium and phosphates. There are three main reasons for this:—

(1) Its formation from rocks rich in minerals.

(2) Low rainfall and high evaporation, both of which tend to keep the available minerals near the surface.

(3) Low production per acre, and consequent low removal of minerals from the land.

A crop of wheat was taken from this paddock, further reducing the plant food supply, and then it was sown down with a mixture of ryegrass, Montgomery red clover, white clover, and alsike.

Effects of Irrigation

Irrigation on such a pasture has several effects.

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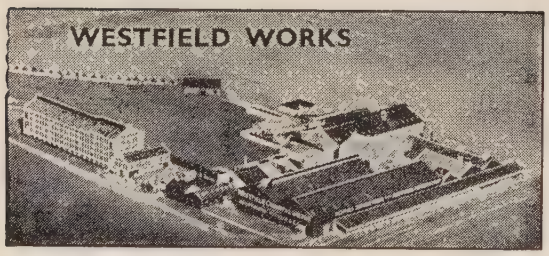

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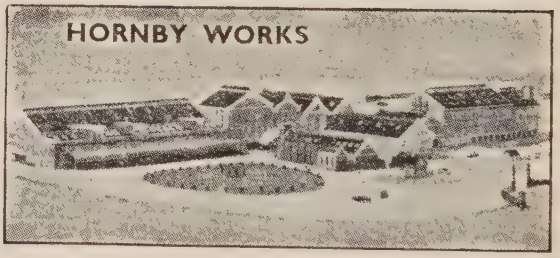
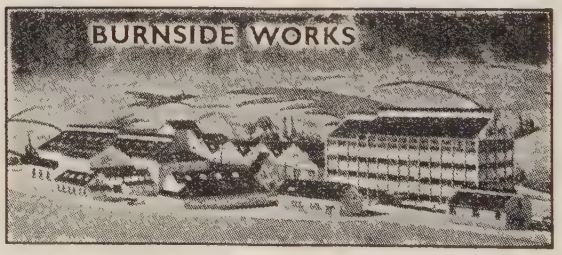
SOUTH ISLAND.





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Firstly, it allows of the maintenance of a good pasture, as the summer kill of clovers can be avoided. In order to maintain a good pasture on irrigated land it is essential that good strains of grasses and clovers should be used. Many pastures on irrigated country fail in this respect and have proved disappointing in the long run.

Secondly, the use of higher producing and long-lived strains of grasses means a higher production of meat and wool. This means a greater removal of food elements from the land.

Thirdly, the increased water supply carries down into the soil the readily soluble food materials and deposits them at lower levels.

A general view of the Omakau district, where the Manuherikia scheme started two years ago.

The pasture shown has been irrigated for three years. The results obtained from the use of water were spectacular in the beginning, because when the limiting factor was removed by adding water the supply of readily available plant foods was rapidly drawn upon. However, although rich in available minerals under non-irrigated conditions, where production per acre was low the total amount of these minerals available for higher production over long periods has been overlooked. The higher production obtained, operating in conjunction with the factors already mentioned, has meant a greater drain on the soil reserves.

In other words, the time has come when water is no longer the limiting factor to production, but something else is lacking, and this is the supply of readily available plant food. When this happens the production from such a pasture will tend to decrease, the food supplied to stock by the pasture becomes less palatable and less nourishing, and the pasture itself is more difficult to maintain.

Topdressing Programme

To overcome this difficulty a programme of topdressing may have to be carried out. The photograph illustrates the point very well. On the left is a strip topdressed with two cwt. of superphosphate to the acre. On the right is the same pasture not topdressed. It will be noticed how heavily grazed the topdressed portion is when compared with the rest of the paddock. This illustrates the point already mentioned that the palatability and nourishing value of the food produced

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from unmanured irrigated pastures declines after a period.

There is some degree of apathy regarding topdressing in Central Otago, no doubt linked with the fact that topdressing on non-irrigated pastures seldom shows a marked effect. It will be found, however, that this is not the case with many of the irrigated areas, where topdressing is a practice that could be more widely adopted with the following advantages:—

(1) Increased production maintained. (2) The maintenance of good grasses and clovers in the sward. (3) Increased life of the pasture. (4) Increased palatability of the pasture.

Are YOU also throwing good fertiliser away?

THIS man is top-dressing in vain. The rushes show that the land is often water-logged, and pasture plants don't flourish enough on cold, wet land to make top-dressing pay. That's why drains should come before any other improvement.

The increased production they promote will soon pay for better buildings and other desired improvements, which will never be fully profitable until the farm is properly drained. Put foundation improvements first and drain your land with field tiles.

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..... J.A. July

The Erection Of A Milking Shed

Importance Of Site And Construction

Contributed by the DAIRY DIVISION.

THE TERM "milking shed" is a survival of the hand-milking days when the milk was taken from the shed to the dairy. The dairy was usually some distance from the shed and closer to the house, and was the place where butter and cheese-making was carried on. This was generally the responsibility of the womenfolk, with perhaps some help with the heavier operations from the men.

Today the term "dairy," as used in the Dairy Industry Act, better describes the milking shed, or, better still, supplying dairy, as used in the dairy regulations to distinguish it from a manufacturing dairy or dairy factory. As milking is conducted today the releaser or separator room is in actual fact the supplier's manufacturing dairy, where the first stages of manufacture are carried out, and must be regarded from that point of view when its construction and equipment are being considered.

Anyone considering the erection of a new milking shed or alterations to one already in use will be well advised to get into touch with the Farm Dairy Instructor in his district, whose address may be obtained from the dairy company which he supplies. This officer is provided with the plans and specifications of a four-cow milking shed, which include the quantities of materials required. The plans and specifications are available free of cost. The instructor will be able to advise on the site, the construction of the building which complies with the regulations, and, if desired, the probable cost.

The Site

The most important point to be considered is the site. If suitable ground is available in the most convenient position on the farm the decision is an easy one, but if not, the next best site must be chosen, and a number of points in this connection are dealt with by regulation. Points worth mentioning are that no permit is required from a local authority to build, alter, or add to a milking shed, and that no fee is payable.

An important consideration, however, is that no shed or yard may be erected within two chains of any public road except with the approval in writing of the Director of the Dairy Division. The reason for this provision is that sometimes the only suitable site on the farm is alongside a road. Such cases should be discussed with the Farm Dairy Instructor.

Consideration should be given also to the proximity of other farm buildings mentioned in a previous article. The ideal site for a milking shed is not to be found on every dairy farm. It may, for instance, be necessary to build the shed on piles two or three feet above the ground level, but these cases are exceptional.

Water Supply

The shed should be built on ground with a firm bottom and on an elevation which will provide natural drainage, although steep slopes should be avoided. If a steep slope cannot be avoided the slope should be away from the shed and yard. The provision of a reliable supply of water has been greatly simplified since electricity and automatic high-pressure water supplies have become available.

Entire dependence on rain water is not satisfactory, as it usually gives out during the dry weather when it is most wanted, and unless it is stored underground it is too warm to cool

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the milk or cream efficiently. In a gravitation supply the pipes should be buried, and if the water is pumped from a well the cooler should be connected directly to the pump so as to get the advantage of the lowest temperature. Water from a tank which has been pumped full in the morning and has had the sun shining on it all day is useless for cooling the night's milk or cream.

In laying out the shed the releaser room should be at the windward end so that any smell from the shed will be blown away from it. If the shed is intended for milk supply it is an advantage if there is a fall at the windward end, as this allows a delivery vehicle to be backed in level with the floor. Drainage should run from the windward end of the building through the shed to a sump.

Pure Atmosphere

As already stated, the plan may be varied to suit the owner's own ideas so long as it complies with the regulations. The surrounding of the releaser room should be kept in grass and free from drains and stock in order to maintain a pure atmosphere, as it is in the releaser room that the milk and cream are first treated in the process of manufacture.

The floor of the shed, yards, and exits must be of concrete. In addition, the walls at each end of the shed in any dairy erected after 1st August, 1938, must be of concrete to a height of 4 feet, and these and all other exposed concrete surfaces in the shed and releaser room must be finished off smooth with a metal trowel to facilitate cleaning. The floor, however, must not be too smooth and slippery.

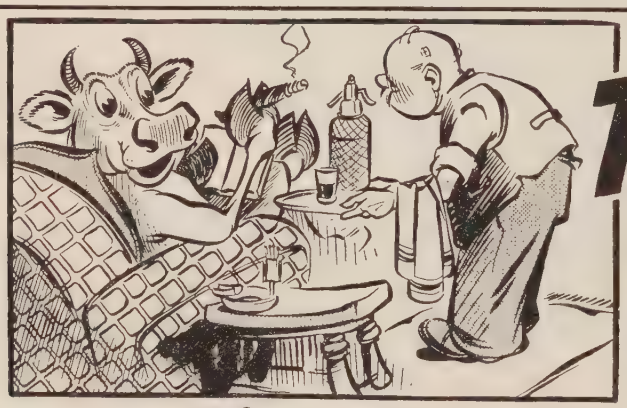
Dwarf concrete walls are provided for in the releaser and engine rooms and also under the wall plate at the back of the shed in order to prevent decay. In the shed these dwarf walls should be at least 1ft. 6in. high, or, better still, 4ft., in keeping with the end wall of the shed. This adds very little to the cost, and complies with the requirements for city supply.

The corner posts of the dummies are usually set on raised concrete blocks, but glazed pipes give a good finish. If desired, the dummy can be suspended from the roof and so make the work of washing down the floor much easier.

Vertical board and batten is in some ways better than horizontal weatherboard on the outside walls, as it is more easily kept clean, and if the inside of the shed is sprayed or limewashed the liquid does not run through and show on the outside of the boarding. Verticle T. & G. boarding for lining the separator room is also easier kept celan.

Draught-Proof Walls

If there is any point which is neglected more than another it is the provision of draught-proof walls between the three rooms of the shed.



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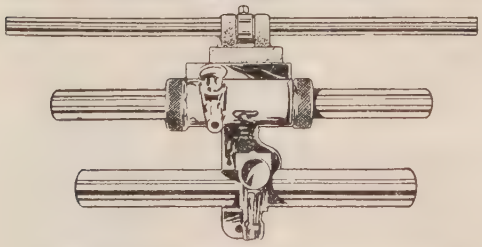

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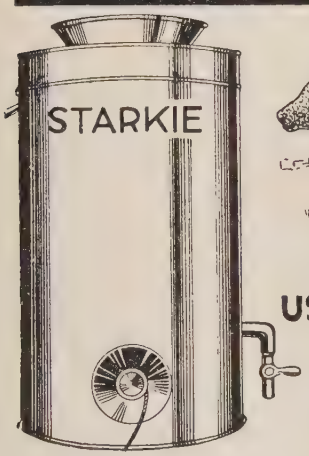
Under perfect management there is probably little danger of the product being contaminated, even if the shed wall is not draught-proof, but there can be little argument regarding the necessity for this provision in the wall between the releaser room and the engine room.

A good dairy has in many instances transformed an inferior supplier into a good one as the result of the stimulating effect of the improved working conditions, but, as already stated, this is not always so, and precautions must be taken to meet the conditions resulting from careless management. In wet weather a neglected yard and shed can be very offensive, and in dry, windy weather dust is a source of contamination which the draught-proof wall helps to prevent.

The verandah which runs the full width of the dairy provides covered access to the engine and separator rooms, and if the wall at the end of the engine room is carried out the full width of the building and continued round the front for three or four feet it provides a good corner for a copper or steam generator.

The position of the yard can be varied to suit the contour of the ground and convenience of handling in relation to other considerations, but must not overlap the releaser and engine rooms. Dwarf walls round the outside of the yard and race will prevent the escape of drainage and assist in keeping the surroundings clean.

AFTER MILKING
COMES THE WASH-UP



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"STARKIE" FOR HOT WATER

Properties of Wood Ash

C.N.F. (PALMERSTON NORTH):—

Could you tell me the properties of wood ash and the form in which it can be purchased?

Are electric hot water services satisfactory for a supply of hot water in cow shed?

FIELDS DIVISION:—

Wood ash varies in composition a good deal because of the wide variation which may occur in the composition of the original wood or plants from which it is derived. Thus, wood ash from timber grown on soils rich in mineral plant foods is likely to be much more valuable than ash from timber produced in poor soils.

Fresh wood ash contains all the minerals which go to make up the healthy plant and is a complete plant food in a fairly concentrated and readily available form, except that there is no nitrogen present. Wood ash is rich in the main manurial elements required by plants, namely, potash, lime, and phosphates, and it makes a good manure, especially if mixed with animal manure such as fowl manure or cowyard manure, the latter supplying the necessary nitrogen to make a complete manure.

Wood ash as such is not available commercially. It might be available from country bakeries or steam plants, such as saw mills, where wood is still used for firing.

DAIRY DIVISION:—

Some of the water heaters installed on dairy farms in the past proved very unsatisfactory for a number of reasons. They were poorly designed, and did not retain the heat. The cylinders were too small to provide the amount of water required, and the elements were not large enough to boil the water between milkings.

Heaters of reputable makes do not now suffer from the first defect, and the two other points are covered by regulation 4 of the Dairy-Produce Regulations, 1938. This regulation contains a schedule of sizes for cylinders and elements which must be complied with in all dairies where an electric heater is installed, and they will be found to give satisfactory results.

If you are considering the installation of an electric heater you are advised to first communicate with the Farm Dairy Instructor for your district, whose address can be obtained from your dairy company.

This subject will be dealt with in an article which will be published in the "Journal" shortly.

Grassing Of Winter-Flooded Areas

Value Of Mercer Grass In Swamps Of Lower Waikato Basin

J. E. BELL, Instructor in Agriculture, Auckland.

ANOTHER ally of *glyceria aquatica* in the swamps of the Lower Waikato Basin is *paspalum distichum*, or Mercer grass. In winter the low-lying lands alongside the Waikato River are flooded and show little promise of the surprising change to luxurious pasture which comes with the summer and the fall in the waters of the Waikato. For six months or more these areas are covered in water many feet deep in places, but, as the floods recede, palatable swards of grass of high production spring up.

This area is an ideal habitat for the growth of Mercer grass, which asserts itself only where the land is covered with water over the winter, and which will survive almost any depth of winter flooding. This grass is probably the most valuable of the swamp grasses (including *glyceria aquatica*) in the Waikato Basin. At present it supplies most of the fodder for stock grazing in those swamps. It has been established there for well over thirty years, whereas *glyceria Aquatica* has been present for a much shorter period, and it is only recently that the latter grass has made its presence felt.

Fig. 1 shows a practical example of the value of Mercer grass. On the left is a view taken in winter of a flooded area. Where Mercer grass is established there is in winter a bare expanse of water with neither rushes, flax, nor other swamp growth. On the right is a photograph of the same area taken on 7th March, 1939. The area was then carrying about one dairy cow and one cattle beast per acre, and these animals were keeping grass well in control. This area, consisting of 15 to 20 acres, was only about four acres in extent four years previously.

In the swamps of the Lower Waikato Basin there are areas of land which are subject to flooding for six months or more during the year. When the waters recede, one of the grasses which spring up is Mercer grass, a member of the paspalum family, and in this article its characteristics on its value as fodder are discussed.

Firm Bed for Cattle

Mercer grass has the typical paspalum leaf with the typical paspalum flower which, in the case of Mercer grass, consists of two spikes joined at their bases. Its leaves and stems are more slender than *paspalum dilatatum*, are upright in growth, reaching up to 3ft. high, but seldom attaining more than 18 inches. It has numerous slender stolons which, with the rooting system, make a firm bed for cattle. When used to swamps, cattle will wander

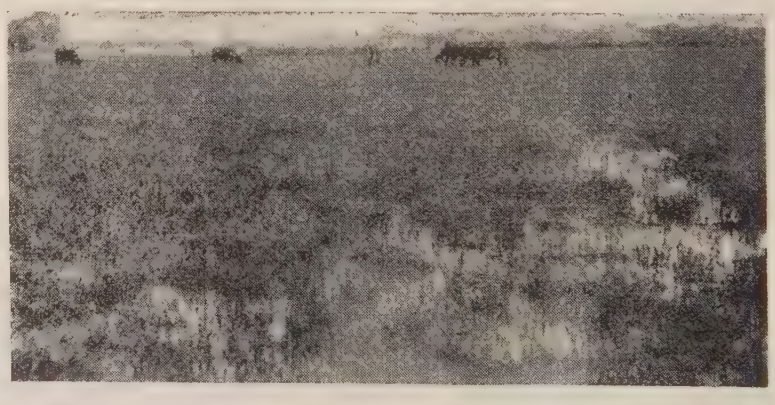

Fig. 2.—Cattle grazing on the area of Mercer grass shown in Fig. 1.

up to one mile from the solid ground browsing on this grass, although before the establishment of this grass they would not venture more than a few yards on to the same swamp.

Like *glyceria aquatica,* Mercer grass rapidly builds up the bed of the swamp, for it steadies the flow of water and allows sediment to settle, and its roots, stolons, stems and leaves lessen the scouring effect. It supplies fields of more than 100 acres consisting purely of this grass. It does not set seed freely, and depends on its overground runners for its march of progress against the rushes of the swamp.

Even on swamps covered with water 2ft. deep in the summer it will send up its stems through the water to spread its leaves to the air and sunlight above. Excessive summer flooding, however, will smother it, and it will not stand as high a flood in summer as the tall *glyceria aquatica.* High summer floods in Lower Watikato in the past few years have destroyed much Mercer grass. On the other hand, it appears to be very susceptible to dry conditions.

Fig. 3.—Paspalum distichum turfs.

Greedily Eaten

There is no doubt about its palatability, as it is greedily eaten by stock. If well grazed it is more palatable and of greater feeding value than *Poa aguatica,* and the young fresh growth is quite as palatable as the more tempting dry land grasses, such as ryegrass and *paspalum dilatatum.* If it is allowed to grow long it assumes a harsh appearance, and is unpalatable. In this way it differs from *glyceria aquatica.*

Mercer grass produces fodder in the summer and autumn, and its production is probably much higher than paspalum in its own habitat. Where Mercer grass is established there is, in winter, a bare expanse of water with no rushes or flax or other swamp growth. In the summer this view is replaced by a field of grass being grazed down to the mud or water level

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by numerous stock—I have seen lambs being fattened on this grass in dry summers.

The only swamp plant liable to obtain a footing in a sward of Mercer grass is willow weed, and it progresses only in areas where the choking of streams has prevented the subsidence of the flooded area sufficiently to allow of stocking *paspalum distichum* is a grass suited to heavy grazing.

When the flooded waters recede in the late spring a bare expanse of oozing mud greets the eye. If the mud is examined carefully stems will be found just at or under the surface. These are last year's stolons still alive, and by this means the plant overwinters the flood. The stolons are quite loose, for there are no anchoring roots. Sickly green shoots appear a little later, and in a few weeks the ground is a solid sward of this grass. being fed usually to fattening cattle or dairy cows.

Effect of Frost

If the soil keeps moist this growth will continue until the first frost destroys the upright growth of stems and leaves or until the deepening flood overwhelms it. Possibly the reasons why *paspalum distichum* is found only where water covers the land in winter is because it depends on the flood to serve as a blanket against damage to the stolons by frost. It will live alongside *glyceria aquatica* in the deeper waters but its range in the other direction is not nearly as great. It is resisting successfully the challenge of *glyceria aquatica*, and under stock grazing conditions it probably would triumph in a struggle for existence against this giant grass.

Events are showing that *glyceria aquatica* prefers to tackle tall flax vigorous blackberry and other swamp growth to this harmless-looking competitor. Yet it is insidious in its march of progress. Like a good general, it surrounds the enemy before attack. It is therefore unlike *glyceria aquatica*, which makes frontal attacks. Stock, by making tracks through the swamp jungle and thus enabling the manoeuvres of Mercer grass, aid its march of progress against rushes, raupo, and other growth. In this way even young willow trees succumb to its smothering embrace.

It is difficult to distinguish Mercer grass from *paspalum vaginatum*, which will live in the driest of conditions, and is to be seen on clay tennis courts

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and roadsides. It also occurs in highly productive dry land pastures, where its aggressive smothering habit and negligible winter growth may make it a menace. From an Australian source I have learnt that *paspalum distichum* likes salty conditions and lives even in the ebb and flow in tidal rivers.

Method of Planting

Paspalum distichum is a very shy seeder, and is therefore propagated by transplanting. This can be most easily done by collecting the stolons in the late spring before they begin growth. These can be strewn over the area to be colonised and tramped lightly into the mud. Always pick an area that keeps moist or muddy over the summer.

There are four valuable grasses which will reclaim alluvial swamps at practically no cost or trouble. Each has its own means of existing among the rising flood. *Glyceria aquatica* will usually grow as fast as the flood rises, and if its stem growth cannot keep pace it will float on top of the water and supplement this to a certain extent by its root growth. *Paspalum distichum* discards roots and upright growth and overwinters by means of its stolons, which lie dormant in the muddy bottom.

Glyceria fluitans, floats its leaves on the running water, being built to stand swift-flowing water. If the flood goes higher than its leaves can float, however, its chance of survival is small. *Phalaris arundinacea*, like *glyceria aquatica*, tries to keep pace with the rising water, but, being of shorter stature, it does not live in as deeply flooded areas.

Nature of Soils

The soils of the Lower Waikato swamps are, for the great part, formed by silts deposited by the Waikato and its tributaries, but there are also large peat areas. The swamp pastures exist almost entirely on the silts. There appears to be some doubt as to whether the peat soils can be reclaimed by swamp grasses.

On the alluvial areas, the alternative to non-expenditure of money on drainage and the establishment of summer producing swamp-grasses is the riddance effectively of the surplus water. If drainage is not completely successful so that ryegrass of high production can be established, the result may not be satisfactory. Unless *phalaris arundinacea* is introduced, half-drained land supports only rushes with a weak competition by grass and clover, and is of much poorer total potential production than land in its natural wet state. It has a virtue, however, which the undrained swamp does not always possess, in that the area is able to carry stock every month in the year.

The owner of a flooded swamp which dries out sufficiently in the summer to support stock has two ways of making the area productive. He can adopt the well-tried method of drainage to dry the land so that it will support grasses suited to it in its natural state. By effective drainage he will obtain production from the area the whole year round. Colonisation with swamp-grasses may result in production during only the summer months.

The establishment of ryegrass-white clover swards can be brought about only by much labour in the erection of stop-banks, the digging of drains, the preparation of a seed-bed, and expenditure in the purchase of a pumping outfit, and the continual maintenance necessary in the cleaning of drains and the pumping out of the water must not be overlooked.

Establishment Simple

The establishment of swamp grasses is neither a costly nor a laborious undertaking. As yet, very little of it has been done, and the great swamp pastures of today owe very little to man for their presence. Beyond a little fencing, the monetary expenditure entailed by the establishment of a wet swamp pasture is practically nothing.

After all, the drainage or non-drainage of swamps is decided by the need of the farmer for winter or summer fodder. If not much dry land is available for the winter feeding of stock, then drainage to make more dry land is probably the correct course. If the farm comprises, for the main part, dry land from which plenty of surplus hay and silage can be made, then the colonisation of the swamp with grasses natural to these conditions may well appeal.

To many, the non-drainage of these great areas is considered a great waste of potential production of farm products. Yet these areas are the safety-valves of the great Waikato River. Too often has the close confinement of great rivers created problems through the silting and continued rise in the river-bed, the inevitable consequential flooding, and the loss of stock and property and risk of life.

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Winter-Feeding The Autumn Litter For Spring Fattening

Feed Trials at Ruakura

C. E. BALLINGER, Asst. Experimentalist, Animal Research Station, Ruakura.

Some of the pigs fed in the trial.

UNDER New Zealand's seasonal system of dairying there is a peak of production in the spring when the by-products of butter and cheese-making are in full supply. This is followed by a gradual decline through the summer to the autumn and a very small production during the winter months. While the dairy cow's production has one peak in the year, the sow's production and her litter's consumption has two peaks, and the chief problem of pig production in New Zealand is the fitting in of the two peaks of consumption with the one peak of feed production.

In the spring the dairy farmer has more skim milk than he requires and not enough pigs. In the autumn he has too many pigs and not enough skim milk to fatten them. It is this problem of fluctuating feed supply which makes store pigs dear in spring and cheap in the autumn. The necessity of having store pigs on hand in spring is met with in various ways.

Some farmers farrow their sows late in May or early in June and carry the sow and litter along on meal and whatever skim milk is on hand. Others farrow their sows later in July and August and go to the saleyards and buy a line of strong stores to take the flush of milk, which is more than the spring litters can cope with. These men meet the competition of other farmers and commercial fattening men who are also faced with a large surplus of skim milk, buttermilk, or whey. Finally, a few endeavour to carry their late autumn litters through the winter on maize, meal, and molasses, etc., but find it a costly venture with the current price for meal.

> From the results of the trials carried out at Ruakura during the last two years it can now be said that winter feeding with roots and a protein supplement, such as meatmeat, is a payable part of the pig industry. Especially is this so when returns are based on the price paid for stores in spring.

Growing Root Crops

If those farmers who are prepared to rear litters on meal or to go to the saleyards and pay 35/- for strong stores would grow a small area of pumpkins, carrots, mangolds, or any other root crop at the rate of half a ton for every pig on hand in the spring they could winter their autumn litters for three months at a cost of, say, 10/- per pig for meal and roots. By this method the pigs are wintered in good store condition and at a reasonable cost.

There is a decided aversion on the part of the dairy farmer and pig producer to the growing of roots for wintering pigs, probably because the idea of growing these crops requires a large area of cultivated land and expensive implements for cultivation. Actually, most dairy farmers can grow all the roots they require on a half to one acre of land with a single-furrow plough as the chief implement of cultivation.

Root crops are at present the only means by which late autumn litters can be carried through the winter economically and in good store condition for bacon production in the spring.

Important Points

A few points must be kept in mind, however, in order to make successful use of this method of pig keeping. Firstly, the pigs must be well fed from weaning until they are 50lb to 60lb

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liveweight, and from then on they must receive daily a small amount of some protein concentrate, such as meatmeal. The success of winter feeding with root crops depends on the use of this small amount of protein concentrate.

A minimum amount of digestable protein of high biological value is necessary to carry on the essential functions of the body and to allow the animal to live and grow. While the digestive system can usually accommodate itself to an excess of protein or other feed constituents without harm, it cannot thrive and make the fullest use of any class of feed if the ration is deficient in protein.

Unfortunately, farm-grown crops such as roots, pumpkins, etc., are deficient in protein. Cereals, too, lack sufficient protein to make them a satisfactory ration of themselves, and in addition the present price of cereals makes grain-feeding alone uneconomic.

Method Advised

The method by which pigs can be economically wintered is therefore by using a foundation of half a pound to a pound of protein concentrate, such as meatmeal. To this can be added half a pound of maize or any other cereal if it can be produced on the farm or bought cheaply. Half a pound of meatmeal as the only supplement, however, gives excellent results.

Together with this small amount of protein concentrate, the farm-produced root crops, pumpkins, etc., are fed, and these crops form a half to two-thirds of the total feed supply, depending on the amount of concentrate fed with them.

In order to gain information on the practice of wintering pigs in store condition trials bearing on the problem have been conducted at Ruakura over the last two years. Various quantities of meatmeal, maize, or a mixture of both are being fed, together with various farm-grown crops, and the following are the results of the 1938 winter feeding trials. The 1937 trials have already been published in the "N.Z. Dairy Exporter," November, 1937.

Meatmeal Trials

Trials with meatmeal and swedes carried out in 1937 gave satisfactory results, and these were repeated with cattle pumpkins in place of swedes. It is sometimes stated that pigs winter satisfactorily on pumpkins and pasture alone, and in order to gain information on this point a group of 12 pigs was placed on pumpkins alone. Two other groups were placed on pumpkins and meatmeal. The following were the rations imposed:—

Group 1.—Cattle pumpkins.

Group 2.—Cattle pumpkins and ½lb of meatmeal per pig per day.

Group 3.—Cattle pumpkins and 1lb of meatmeal per pig per day.

The pigs used in all the winter feeding trials were purebred Berkshires. All rations were weighed, and any refused material was collected and deducted from the amount offered. The pigs were run in quarter-acre paddocks, and were fed to appetite twice a day. The pigs were on trial for 12 weeks.

Results Obtained

The results obtained with the three groups may be seen from the following table:—

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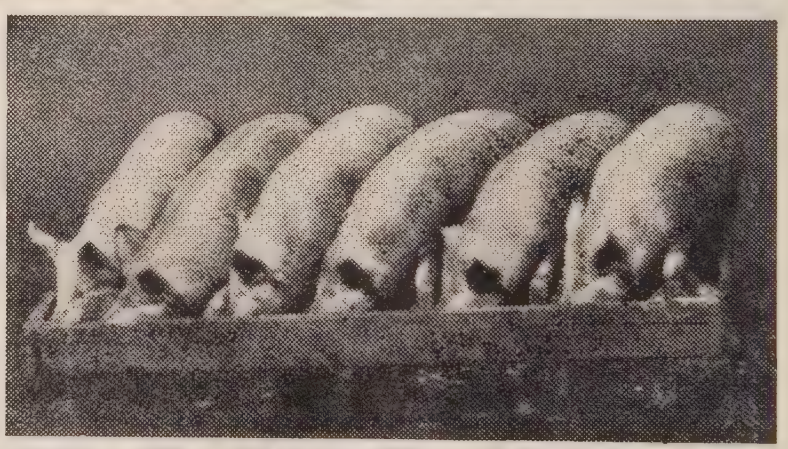

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TABLE 1.
Liveweight Increase.

Group	1	2	3
No. at commencement ..	12	12	12
No. at end of trial	12	12	12
Av. initial liveweight ..	61.0 lb.	56.6 lb.	53.5 lb.
Av. final	68.08 lb.	83.4 lb.	84.3 lb.
Av. increase	7.08 lb.	26.8 lb.	30.8 lb.
Av. increase per pig per day	.08 lb.	.32 lb.	.36 lb.

One of the striking features of these results is the poor rate of growth obtained when pigs are fed a protein-deficient diet and the improved rate of growth which is obtained with the addition of a small quantity of meat-meal.

The second important point shown in the trial is the waste of food which takes place when the animal receives a ration which is deficient in some essential factor. In many instances a deficiency of any one essential part is accomplished by a lowered consumption of the total ration. In this instance, however, the amount of pumpkins eaten by the group on pumpkins alone was very large, as may be seen from the following table of consumption:—

Pumpkin Consumption.

Group.	Ration.	Total Pumpkins per p'g (lb.)
1	Pumpkins only	2833
2	Pumpkins and ½lb. meatmeal	2063
3	Pumpkins and 1lb. meatmeal	1662.5

Group 1 ate a ton and a quarter of pumpkins per pig in 12 weeks, and a liveweight increase of 7.08lb was returned. The appearance of the group was rough and unthrifty, and two of the animals appeared very sick during the trial period.

The results obtained when a small amount of protein concentrate is fed with pumpkins is well seen by comparing the growth obtained with Groups 2 and 3 with Group 1. The ration of half a pound of meatmeal a day or 42lb for three months by Group 2 feeding has given a superior liveweight gain of approximately 19lb and reduced the consumption of roots by 770lb per pig.

Group 3, on 1lb of meatmeal, show a disappointing rate of gain compared with Group 2, but again the consumption of pumpkins has been reduced by 1170.5lb compared with Group 1 and 400.5lb compared with Group 2. This result differs from that obtained in 1937, when in similar trials pigs receiving 1lb of meatmeal ate the same quantity of roots as pigs on half a pound, but grew at the rate of .52lb per day.

Costs and Returns

The question that immediately arises is: What is the cost of wintering pigs by this method, and does it pay? It can be said in reply that the method does pay, and for the following reasons:—

(1) It is a means of having large stores on hand to consume the spring flush of milk;

(2) If roots are costed at 5/- a ton and meatmeal at current rates, then the carcass weight increase taken at 6d a pound returns the greater part of the outlay;

(3) If the difference between autumn and spring prices is taken as a basis of valuing the feed used, the method shows a satisfactory return. The improvement in value of pigs as wintered is very much greater than the cost of feed used.

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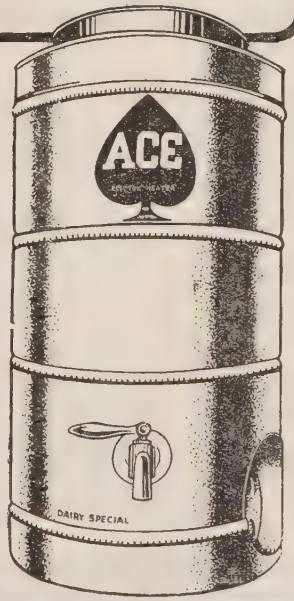

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In the following table the cost of meatmeal is taken at 13/9 per cwt., roots at 5/- per ton, and the value of the liveweight increase has been calculated in terms of carcass weight by taking the carcass weight as 70 per cent. of the liveweight valued at 6d per pound. The market value of the pigs is the average price for stores similar to those on trial.

In the 1937 trials a number of the pigs were sold in order to make the financial aspect of the trials as complete as possible. This was not possible for the 1938 trials, as the pigs were required for carcass quality investigations.

Maize Trials

Maize is a popular pig feed with many pig farmers, especially in districts where good crops of maize can be grown. While maize is a valuable concentrate for fattening when fed with some form of protein, it is not a satisfactory ration by itself. Pigs can be wintered on maize and roots or maize and pasture, but the quantity required is too costly at present prices.

The current price for maize makes it as costly a feed as meatmeal, and with maize at £11 7s a ton and meatmeal at £13 10s the cost per feed unit is the same for each and meatmeal is then the better concentrate for wintering pigs, both from the nutritional and the economic point of view.

Where a farmer can grow his own maize he should still use ½lb. to 1lb. of meatmeal or one gallon of skim milk per pig per day as the basic ration of his winter feeding. He can add to this basic ration a pound of maize per head if he wishes, as the animals are receiving adequate protein to enable them to make best use of the maize.

TABLE 2.
Costs and Returns per Pig.

	Group 1.	Group 2.	Group 3.
Costs of meatmeal	—	4/10	9/8
Wintering roots	6/4	4/5¾	4/2
Total	6/4	9/3¾	13/10
Returns.—70% of carcase at 6d. lb.	2/5	9/3½	10/8
Market value of pigs—			
In autumn	10/-	10/-	10/-
In spring	20/-	28/-	28/-
Improvement in value = gross return for feed used	10/-	18/-	18/-

Rations Fed

In order to ascertain the actual results of wintering pigs on roots and small amounts of maize and to compare the results with those obtained by the use of roots and meatmeal, the following rations were fed to experimental groups of pigs:—

Group 4.—Cattle pumpkins and ½lb. of maize per pig per day.

Group 5.—Cattle pumpkins and 1lb. of maize per pig per day.

Group 6.—Cattle pumpkins and 1½lb. of maize per pig per day.

The results obtained with these rations may be seen from the following table:—

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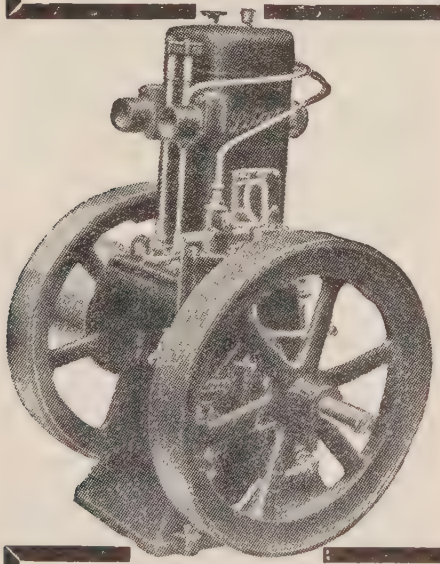

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BRANCHES AND AGENCIES THROUGHOUT NEW ZEALAND

TABLE 3.

Group.	4	5	6
No. at commencement ..	12	12	12
No. at end of trial	10	10	12
Mean initial liveweight ..	55.1	53.2	54.0
Mean final liveweight ..	61.0	69.7	78.5
Mean increase	5.9	16.5	24.5
Mean increase per pig per day	.07	.2	.29

It will be seen that the pigs on a basic ration of maize did not thrive as well as those on similar quantities of meatmeal. Group 4 on ½lb. of maize grew less than Group 1 on pumpkins alone; in addition, two pigs of Group 4 died of pleurisy. Group 1 was slightly heavier when commencing their trial, and were probably more able to withstand the poor ration. The amount of protein in half a pound of maize is negligible, and Group 4 received a ration no better in protein-content than Group 1, fed pumpkins only.

Lowered Vitality

Groups 5 and 6 on 1lb. and 1½lb. maize respectively grew at a slightly better rate, but neither thrived as well as pigs on half a pound of meatmeal. In addition, two pigs from Group 5 on 1lb. of maize per pig died. While death was found to be due to pleurisy in all instances, it is probable that death was primarily due to the unbalanced ration lowering the vitality of the anmals and leaving them susceptible to disease.

It has been stated previously that a common result of feeding a protein-deficient ration is that the animal reduces its consumption to the minimum that keeps it alive, and the feeding of maize with roots in these trials appears to have allowed the pigs to reduce their consumption in that way, the actual quantities consumed being as follows:—

Root Consumption.

Group.	Ration.	Consumption per pig (lb.)
4	Roots and ½ lb. maize	1114
5	Roots and 1 lb. maize	928
6	Roots and 1½ lb. maize	953

One difference in the feeding of Groups 1-3 compared with Groups 4-6 was that the crop of pumpkins was not sufficient for all groups for 12 weeks' feeding. Groups 4-6, therefore, had their ration changed from pumpkins to swedes and mangolds for approximately half the feeding period. In view, however, of the feed values of these roots being very similar to pumpkins, and from the results of other trials, it can be assumed that the reduction in roots eaten was not due to the change from pumpkins to swedes and mangolds.

The costs and returns for wintering pigs on maize and roots has been calculated in a similar manner to that for meatmeal and roots—maize has been costed at 12/4 per cwt.—and the results are as follow:—

TABLE 4.

Costs and Returns per Pig.

Group.	4	5	6
Cost of maize	4/6½	9/1	13/7½
Wintering roots	2/6	2/– approx.	2/– approx.
Total	7/0½	11/1	15/7½
Returns 70% carcase at 6d. lb.	2/–	5/9	8/7
Market value of pigs—			
In autumn	10/–	10/–	10/–
In spring	15/–	20/–	24/–
Improvement in value = gross return for feed	5/–	10/–	14/–

Many farmers object to wintering their autumn litters by means of roots and meals because of the costs of cultivation entailed compared with the returns. However, as many of these farmers are prepared to buy store pigs at the prices given it is of interest to deduct the cost of meals used from the market price of the pigs and to credit the difference to the roots consumed.

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TABLE 5.

Group.	1	2	3	4	5	6
Sale value spring	20/–	28/–	28/–	15/–	20/–	24/–
Concentrates	—	4/10	9/8	4/6	9/1	13/7½
Sale value autumn	10/–	10/–	10/–	10/–	10/–	10/–
Difference credited to roots	10/–	13/2	8/4	6d.	11d.	4½d.
Root consumption (approx.)	1.25 tons	.9	.7	.5	.4	.4
Returns per ton	8/–	14/7	11/10½	1/–	2/1	11d.
Returns at 30 tons per acre	240/–	437/6	356/3	30/–	62/6	27/6

From the above, it is obvious that the return for roots is profitable if fed with a protein supplement. When fed with maize at £12 4s roots did not give a payable return this year. This trial does not condemn the general use of maize fed together with roots to pigs in winter, but it does emphasise the importance of that "unseen" amount of grass, skim milk, or other protein which is so essential and which pigs do get where maize and roots are satisfactorily used.

Conclusions

From the results of the trials carried out at Ruakura over the last two years it can now be said that winter feeding with roots and a protein supplement, such as meatmeal, is a payable part of the pig industry. Especially is this so when returns are based on the price paid for stores in spring.

It is a means of utilising the late autumn litters that cannot be fattened profitably because of the lack of skim milk. The store pigs on hand in spring are able to consume the flush of milk, which is difficult to make the fullest use of with spring litters only, and the quality of the bacon carcasses from pigs wintered on meatmeal and roots is entirely satisfactory.

List of Certified Seed Potato Growers

IN AN endeavour to arrange for an earlier circulation of information relative to those potato crops which have been provisionally certified under the Department's seed potato certification scheme, a departure from the usual procedure of circulating this information has been made.

In the past it has been the practice to publish the list of growers in the "Journal of Agriculture" and to have reprints prepared for distribution. A saving of time has been made this season, however, by having the complete list prepared as a separate publication. As a result of this step it has been considered unnecessary to publish the information later in the "Journal."

The attention of those interested in the information contained in this list is directed to the fact that supplies are available either from the Director of the Fields Division, Department of Agriculture, Wellington, or from any local branch of the Department at which a Fields Division officer is stationed. Those desiring a copy of this publication are requested to inquire for the "List of Provisionally Certified Seed Potato Growers, Season 1938-39."

—J. H. CLARIDGE, Seed Certification Officer, Wellington.

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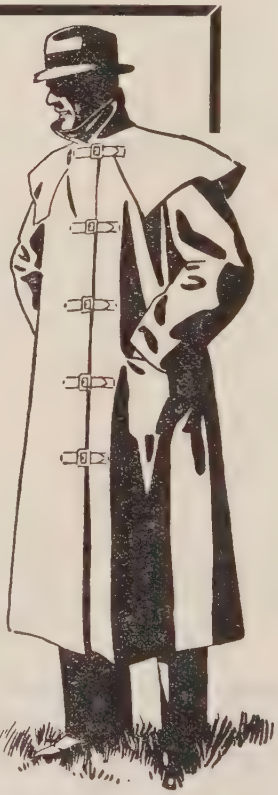

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Agricultural Workers

Wages, Hours and Conditions for Horticultural Occupations

A. E. MORRISON, Solicitor, Department of Agriculture.

THE Agricultural Workers' Extension Order, 1939, extends the provisions of the Agricultural Workers' Act, 1936, with the necessary modifications and with the further modifications set out in the Order to agricultural workers employed by market gardeners, soft-fruit growers, nurserymen, and landscape gardeners in the Northern Industrial District. The Order came into force on May 29, 1939, and will continue in operation until March 31, 1940, and thereafter until a further Order is made. The provisions of the Order relating to wages, however, are deemed to have come into force on January 23, 1939.

A week's work for male and female workers consists of 44 hours worked in a five and a half-day week calculated from any Sunday to the following Saturday, both days being inclusive. In special circumstances, the harvesting of certain classes of vegetables, attendance to the heating system, or the picking and packing of fruit, or watering and ventilating may be carried out on Sundays or on holidays, provided the workers are paid at time and a half rates or are given equivalent time off.

All time worked in excess of 44 hours is deemed to be overtime, which must be paid for at ordinary rates for the first four hours and thereafter at time and a half rates.

Rates of Wages

The minimum rates of wages are as follows:—

(a) Male adult workers, £4 per week.

Male adult casual workers, 2s per hour.

Nurserymen and landscape gardeners, £4 5s per week.

Leading hands in nurseries employing four or more hands, £4 10s per week.

(b) Minimum rates of wages per week for youths are as follows:—

MALE WORKERS.

Under 16 years of age, 15s or, if found, 10s.

From 16 to 17, £1, or, if found, 15s.

From 17 to 18, £1 10s, or, if found, £1.

From 18 to 19, £2, or, if found, £1 7s 6d.

From 19 to 20, £2 10s, or, if found, £1 12s 6d.

From 20 to 21, £3, or, if found, £2 2s 6d.

(c) **FEMALE WORKERS.**

Under 17 years of age, 15s, or, if found, 10s.

From 17 to 18, £1, or, if found, 15s.

From 18 to 19, £1 5s, or, if found, 17s 6d.

From 19 to 20, £1 10s, or, if found, £1.

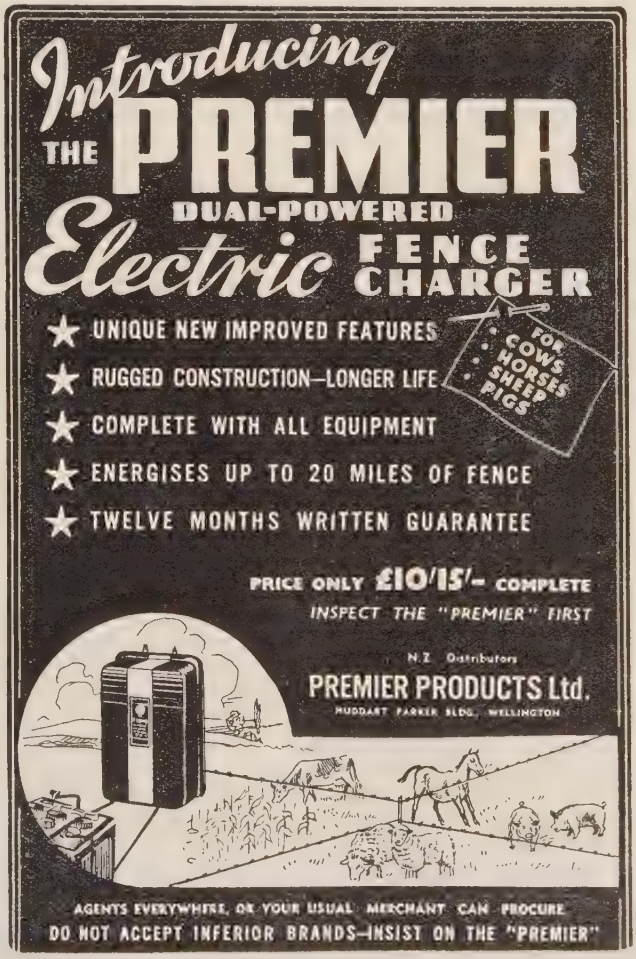
From 20 to 21, £1 15s, or, if found, £1 2s 6d.

Thereafter, £2 4s, or, if found, £1 9s.

Wages must be paid weekly in cash not later than Friday. An employer may make a rateable deduction therefrom for any time lost through accident, sickness, or default of the worker.

Hourly Basis

Both male and female workers may be employed on an hourly basis. Adult female workers when so employed must be paid 1s 3d per hour, except that nursery workers and grape pickers where the worker is not re-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quired to carry weights of more than 28lb must be paid at a rate of not less than 1s per hour. Female workers engaged in hard manual labour, such as hoeing, ploughing, carrying, etc., excepting the piece-work specified in the Order, must be paid at the rate of 2s per hour.

Where board and lodging is provided for adult workers a board-allowance of 15s per week for females and £1 per week for males shall be deducted from wages payable to them.

The proportion of junior male workers to senior male workers shall not be more than one to every adult male worker, but an employer engaged on the job is equivalent to a senior male worker for the purpose of this proportion. A senior worker means a male worker paid not less than £4 a week, or, if found, £3 per week, or in the case of a worker employed by the hour he must be in receipt of not less than 2s per hour. In consequence, a junior worker means a male worker in receipt of less than £4 per week, or less than £3 per week, if found.

Holidays

Holidays, namely, Christmas Day, Boxing Day, New Year's Day, Good Friday, Easter Monday, Labour Day, Anzac Day, and the King's Birthday are observed without deduction of pay. If a worker is required to work on such holiday he must be given equivalent time off at a time to be mutually agreed upon by the employer and the worker. Exclusive of the days mentioned, a worker must be allowed a week's holiday on full pay at the end of 12 months' service, or a proportionate holiday must be given to workers of not less than six months' service.

Except in the case of casual workers and piece-workers, employment may be terminated on either side by giving 24 hours' notice, but an employer may summarily dismiss a worker for misconduct.

Union Membership

Every worker employed within the scope of this Order must be a member of the Auckland Gardeners' and Gardeners' Labourers' Industrial Union of Workers and pay union dues accordingly. By arrangement with the union, an employer may collect union dues from the workers and forward them within seven days of collection to the union office. The Order also provides that the secretary or other representative of the industrial union shall be permitted to interview workers during working hours, provided that he does not interfere unreasonably with the operation of the employers' business.

If a dispute arises between an employer and a worker regarding a matter not covered by the terms of this Order the dispute shall be settled between the employer concerned and the secretary or president of the union, and in default of agreement between these parties the matter shall be referred to an inspector, whose decision shall be final.

The Order prescribes the operations on which piece-work may be worked and the rates of payment obtaining.

Copies of the regulations may be obtained on making application to the Government Printer, Wellington, C1, price 6d, plus postage 1d.

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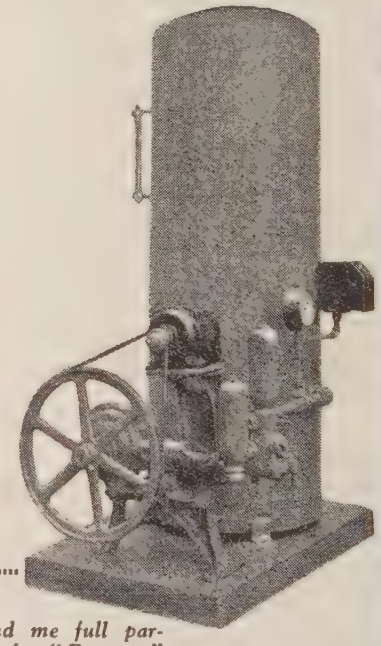

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Fig. 1.—Crested wheat grass (two years old) from Upper Awatere, Marlborough.

Crested Wheat Grass Trials in the South Island

D. R. WILKIE, Instructor in Agriculture, Blenheim.

Fig. 2.—Slender wheat grass from the same area and sown at the same time.

THAT high country farming is becoming increasingly beset with problems is a fact that even the most disinterested observer cannot overlook. Not the least of these problems are connected with the land itself and the consideration of problems such as soil erosion, reversion to second growth, depleted pastures, and increases in weed growth.

Much of the land under consideration is inaccessible as regards any sort of cultivation, and consequently operations in connection with it are somewhat restricted. Further, because of the low value of the land in many cases any outlay per acre for improvements has to be considered very carefully.

Efforts have been made by the Department of Agriculture since 1910 to find a grass suitable for assisting in the regrassing of depleted run country, and the favourable reports that have followed the introduction of crested wheat grass (*Agropyron Cristatum*) indicates that this is a grass which should prove well adapted to our run conditions. It has been tried out experimentally on quite a number of areas in the South Island, and as far as can be ascertained has given satisfactory results.

Many desirable characteristics are possessed by crested wheat grass, and if the Canadian experience with this grass is duplicated in New Zealand it will be a valuable contribution toward the covering of much of our inaccessible country.

Characteristics.

Crested wheat grass is a native of Russia, and is known to flourish there in places where exceedingly rigorous conditions are the rule. It was introduced to America, but it was not until 1927 that its definite suitability for Canadian conditions was recognised. It is now sown freely on land that formerly was either bare or was covered with thoroughly depleted pastures and an abundance of weeds.

The grass is a long-lived perennial, and produces a great bulk of nutritious feed, and its very extensive root system enables periods of drought to be withstood successfully. Prolific seeding is another feature which makes rapid spreading possible, and this accounts for reports of the grass being capable of excluding almost all other plants in the sward.

In several parts of New Zealand a mixture of slender wheat grass (*Agropyron Pauciflorum*), a native of Western Canada, and true crested wheat grass was sown in trial plots by the Department of Agriculture. As is shown in the photographs, crested wheat grass is a much more robust species and the leaf production is greater. This variety has found favour in Canada, and under New Zealand conditions it appears to be equally preferable. Both the plants depicted are from an area in the Upper Awatere, Marlborough, and are from a two-year-old stand.

Adaptability.

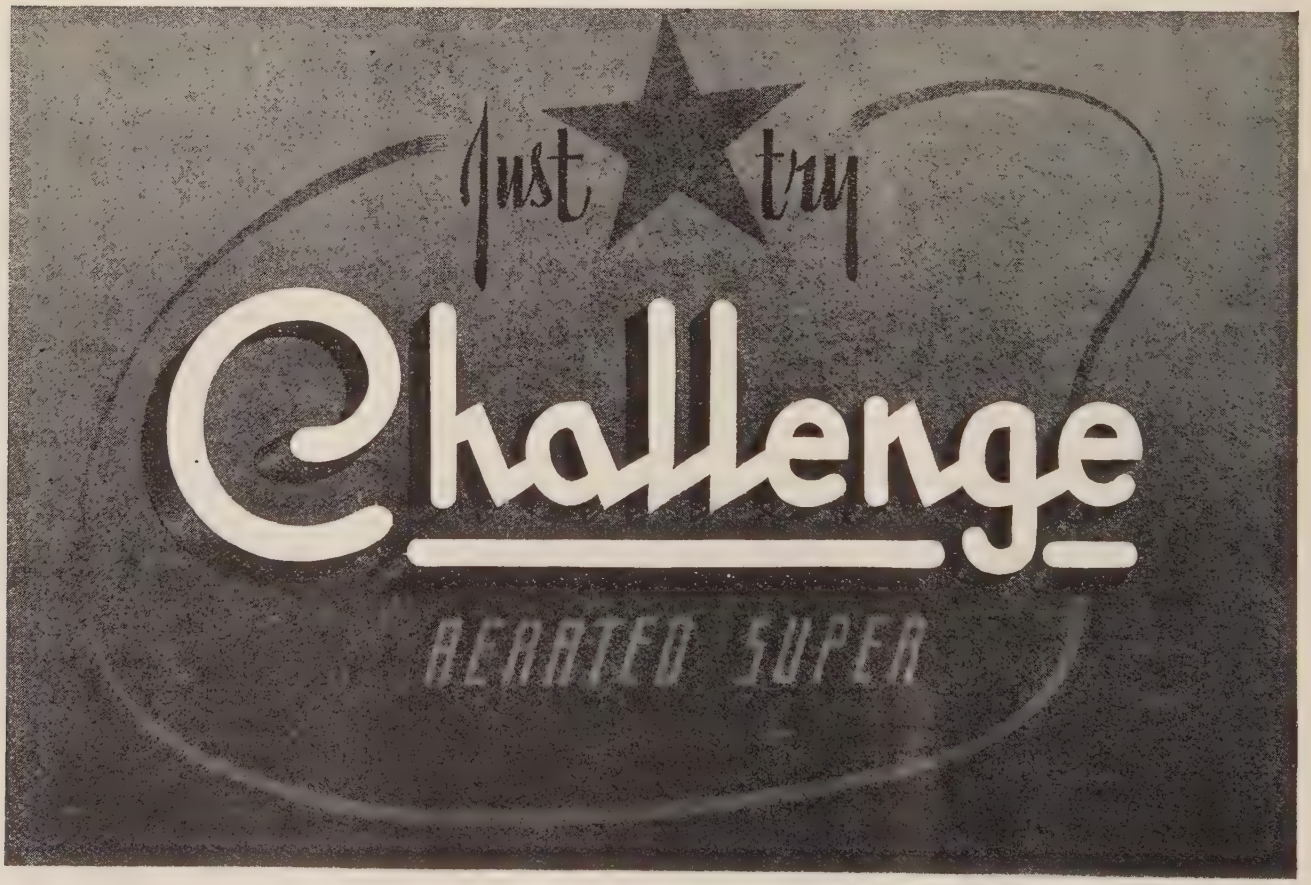
A wide variety of soil offers a habitat for crested wheat grass. Successful stands have been obtained in light sandy and silt loams, and also in heavy clay. Extreme cold in winter and warmth in summer—factors which sound the death knell of many of our present grasses—do not affect crested wheat grass. Further, it has been found that in comparison with other grasses it shows up best when the rainfall is between 10 and 18 inches.

High yields are also obtained under more humid conditions, and excellent hay may be made. Nevertheless, in the growing of this grass there is a critical period which occurs during the first six weeks after sowing. It is essential that favourable conditions for germination and growth prevail during this period, following which adverse conditions will be withstood with ease. Thus, autumn-sowing in this country would be advisable.

Feeding Value.

The palatability of the grass is high, and it is relished by all classes of stock. Trampling and heavy grazing have no deleterious effect, and the bulk of the feed produced is highly satisfactory. Canadian experiments have shown that the feed produced is highly nutritious and compares favourably with the best grasses sown there. Another point worthy of mention is its resistance to disease; stem rust and ergot diseases, which affect many of our common grasses, are unknown.

Fig. 3.—Experimental plots of crested wheat grass.
[*E. A. Madden, photo*]



To sum up, it might be said that here is a grass which has many desirable qualities— high feeding and palatability factors, resistance to rigours of climate and disease, excellent production, and vigorous growth. The bulk of these observations apply to Canada, but the experiments and areas sown in New Zealand substantiate these claims very considerably.

Position in N.Z.

Seven years ago sample packets of seed were received from overseas and sown in small experimental areas, ranging from Otago to Marlborough. Recent reports received from these areas have been highly satisfactory. Because of the difficutly of obtaining further seed from overseas—as there was insufficient in Canada to supply the local demand, export was out of the question—these areas were allowed to seed, and the produce was sown out.

Trials were laid down in Marlborough by the Department in the Upper Awatere and the Clarence Valley in 1937, both areas having a scanty rainfall and rigorous winters. Here the plants have done well, and further seed is urgently required.

Through the courtesy of a Western Canadian Experimental Station 100 lbs. of crested wheat grass seed is now available. It is intended to sow the bulk of this seed in the Upper Awatere this autumn, and to reserve enough for an acre or so on better land nearer Blenheim. This latter area is to be for seed production and demonstration purposes.

If the Canadian experience with crested wheat grass is duplicated in New Zealand—and indications are that this should be the case—the grass will be a valuable contribution toward the covering of much of our more inaccessible country.

The "New Zealand Listener"

The "New Zealand Listener" is the only magazine publishing the complete programmes for radio broadcasting in New Zealand. One of its features of special interest to farmers is a page devoted to those sections of the programmes dealing with farm topics. Coming talks and events are announced and talks given over the air are reviewed. It is not a page of technical advice to farmers, but a guide telling farmers where and when to listen to useful broadcast information.

Other pages, too, are of interest to the farmer's family. Classical and modern music, drama, serials, talks on all subjects, sporting information, women's topics, items to interest children are all noticed. As the official magazine of the National Broadcasting Service the "Listener" acts as the complete guide to listeners.

Mr. L. BROWN RETIRES

After 40 years service with the Western Steel Company Mr. L. Brown retired today at the age of 61. In response to the congratulatory addresses, Mr. Brown thanked his many friends and told the staff of his plans for the future. He said that he and his wife intended to travel and visit the many countries they had always longed to see.

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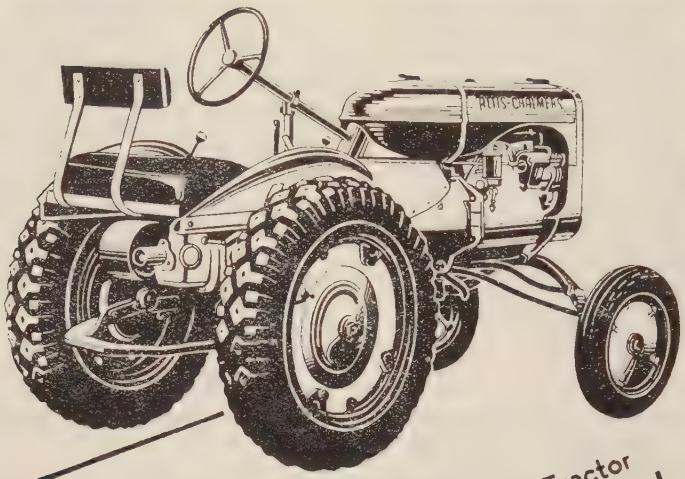

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Yours faithfully,

(Sgd.) A. J. CHAMBERS.

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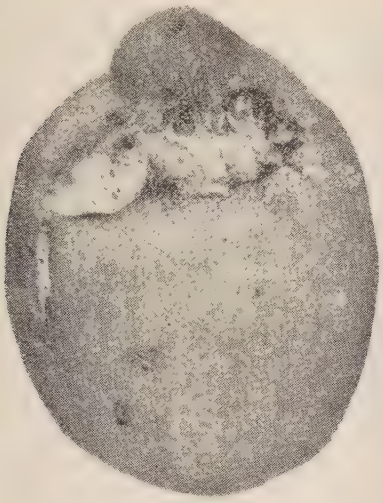

Citrus Pests (No. 8)

The Leaf-Roller Caterpillar and Other Insects

W. COTTIER, Plant Research Bureau, Department of Scientific and Industrial Research.

Fig. 1.—Lemon fruits injured by leaf-roller caterpillars.
[*H. Drake, Photo.*

THE life histories, seasonal histories, etc. of leaf-roller caterpillars have not been studied in any detail on citrus in New Zealand, and almost all that is known is that the three species, *Ctenopseustis obliquana* Walk., *Tortrix excessana* Walk., and *T. postvittana Walk.* have been recorded from that host.

The details of life histories given below comprise a general account taken from work previously carried out on deciduous fruit trees, and the details are meant to be taken merely as an approximation of the position on citrus. Details of habits are drawn from the experience of the writer.

Fig. 2.—The moths of leaf-rollers. Upper, *Ctenopseustis obliquana;* middle, *Tortrix excessana;* lower, *Tortrix postvittana.*
[*H. Drake, Photo.*

Appearance

The adults of leaf-roller caterpillars are moths (Fig. 2). The colour of the forewings in *Ctenopseustis obliquana* is usually brown to dark brown or reddish-brown, with darker brown or, in many cases, quite light-coloured markings. The hind wings are usually very pale grey to brownish-grey, with darker grey markings.

In *Tortrix excessana* the fore-wings are usually dull to bright reddish-brown with faint darker markings, while the hind wings are a light grey. *T. postvittana* has each fore-wing usually reddish-brown on one half, while the half nearer the body is much lighter. The hind wings are a pale yellowish-brown.

Leaf-roller caterpillars are approximately ¾in to 1in long when full grown, and are usually greenish, brownish, or whitish with a dark brown head.

Life History and Habits

The eggs are laid on the foliage by the moths in oval or sub-circular flattened masses, usually containing 50 to 100 oval, flattened, and overlapping eggs. The egg masses are usually light in colour; for example, light greenish or yellowish. About 14 days elapse between laying of the eggs and their hatching. The length of the life of the caterpillars varies from one to two months according to the time of year. The brown or greenish chrysalis or resting stage in which transformation from caterpillar to moth takes place is contained in the rolled and webbed leaves formed as the caterpillar shelter, and in the summer this stage may occupy about 14 days.

The winter is apparently passed in the caterpillar stage in rolled-up leaves on citrus, but they are also to be found on alternate evergreen hosts, and at this time the caterpillar life may occupy four to six months.

The adult moths are active during the evening and early part of the

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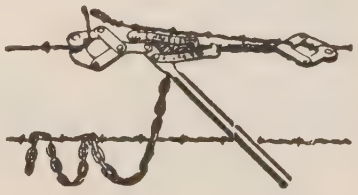

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Fig. 3.—Lemon wood injured by cicada egg-laying. Left, old injury; right, new injury.
[*H. Drake, Photo.*

night and do not fly during the day unless disturbed. In the day time they shelter on the undersides of the leaves and on citrus. The adults may be found on citrus at almost any time of the year but are most abundant during the summer months. There are usually about three generations per year.

Characteristics

As the name implies, the characteristic of these caterpillars is that they roll up leaves, tie leaves together, or tie leaves to fruit, etc., all by means of webbing. Their importance as pests lies in the fact that the caterpillars chew the skin of the fruit and cause blemishes, some of which are very extensive.

Damage may be noticed from the time the fruits of both lemons and oranges are about half-an-inch long, when small whitish spots show where the skin has been damaged, and if a search is made a small caterpillar may be found in the little "cup" at the stem-end or the presence of webbing will show where it has been.

Sometimes, in the case of Poorman oranges, damage at this time is extensive, as feeding marks frequently occur over large areas of many fruits, and the punctures are so close together that with the collapse of adjacent cells the whole damaged area on each fruit may coalesce to form an extensive grey or dark brown mark.

Another characteristic of damage at this period of growth is a circular ring made round the stem end, this circular blemish becoming pushed out further from the stem as the fruit grows. When the fruit is larger the caterpillars may tie leaves to fruits or web several touching fruits together, and in these shelters they may cause extensive damage (Fig. 1). In such cases it is quite common to find that a hole has been bored right into a fruit.

Hosts and Distribution

Some alternate hosts of citrus leaf-rollers are *Correa speciosa, Boronia ledifolia, Personia lanceolata, Grevillea robusta, Polygonum* sp., pelargonium, apple, pear, rose, grape, pines, lupin, oak, peach, honeysuckle, *Nothopanax arboreum*, ngaio, manuka, and *Muhlenbeckia*, etc.

Tortrix postvittana is reported from Australia and New Zealand, and is said to have been introduced into Hawaii. As far as is known, *T. excessana* and *Ctenopseustis obliquana* are both reported from New Zealand only.

Control

To control leaf-roller caterpillars spray with lead arsenate 1½lb to 100 gallons water whenever necessary. This spray should be used as sparingly as possible, as it has been shown in other countries that arsenicals may have a deleterious action on the taste of the fruit.

Miscellaneous Insects

Cicadas

Cicadas, erroneously called locusts by many people, frequently lay their eggs in the young twigs of citrus trees. To do this they insert a sharp saw-like egg-laying apparatus into the tissue of the twig, and this operation causes the typical "cuts" shown in Fig 3. As far as is known, however, these injuries are of no economic importance on citrus.

Other Insects

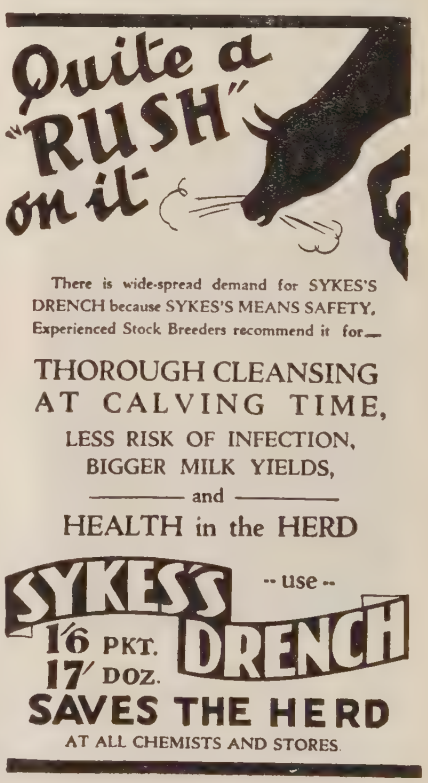
The orange snow scale (*Chionaspis citri* Comstock) has been reported from New Zealand by Maskell (1887), but it is not a pest in our citrus areas, and has not been discussed.

Other insects commonly found on citrus are the plant-hoppers *Scolypopa australis* Walk. and *Sephena cinerea* Kirk. The first is an insect about two-fifths of an inch long from head to tip of wings when these are folded. The wings are clear, with dark brown markings. The adult of *Sephena cinerea* is somewhat smaller than that of *Scolypopa australis*, and is bluish-grey in colour. The immature forms of these plant-hoppers are familiar insects on citrus foliage, being furnished at the tail end with conspicuous tufts of white threads. Both immature and adult forms hop vigorously when disturbed. As far as is known, however, plant-hoppers cause no economic damage to citrus, and they have not been considered further in these articles.

Acknowledgment

I have to thank Mr. Dumbleton, of Cawthron Institute, Nelson, for the moths shown in Fig. 2.

In the preparation of this article some of the information contained in the following paper has been used:—Dumbleton, L. J., 1932: "The Apple Leaf-roller (*Tortrix postvittana* Walk.)." "N.Z. Journal of Science and Technology," 14, No. 2, pp. 83-92.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AT ALL CHEMISTS AND STORES.

Seed Wheat Certification

Contributed by the FIELDS DIVISION.

THE following is a list of growers whose wheat crops have passed both the field and grain inspections as required under the Government scheme for the certification of seed wheat. The seed from these crops is not recognised as finally certified until it has been satisfactorily machine-dressed and the sacks suitably tagged and sealed. Previous lists of growers appeared in the March, April, May and June issues of the "Journal."

Variety.	Grower's Name and Address.	Acreage.
Dreadnought:	Hossack, G., Arno, South Canterbury	8
	McDonald, M., Allen Street, Waimate	5
	O'Connor, W., Gray's Corner, R.M.D. Waimate	18
Hunters II.:	Bisdee, J. C., Claudeboye, Orari ..	11
	Kelliher, T., Pleasant Point (Line A)	5
	Kelliher, T., Pleasant Point (Line B)	5
	Kelliher, T., Pleasant Point (Line C)	5
	McCullough, S. G., Rangatira Valley, Temuka (Line A)	10
	McCullough, S. G., Rangatira Valley, Temuka (Line B)	30
Solid Straw Tuscan:	Carr, J., Mt. Hutt R.D., Rakaia (Line A)	28
	Edgar, R. J., Seadown, R.D., Timaru	10
	Lyon, John., Temuka	30
	Lyon, W. J., Kakahu Rd., Temuka ..	9
Jumbuck:	McCarron, Est. of W. Hook, Waimate	25
	Harding, A., Otapiri R.D., Winton ..	20
Bencubbin:	Cuthbertson, Est. of I., Waitaki, North Otago	12

Popularity of Meadow Fescue

The popularity of meadow fescue is increasing in Eastern Southland. One farmer has a paddock that has been seeded three years in succession, but this has had no adverse effect on the palatability of the feed and the recovery after grazing is rapid. Another farmer sowed part of a paddock with meadow fescue and part with ordinary Southland rye. The sheep have shown a decided preference for the meadow fescue, and this farmer is so impressed with the results that it is his intention to substitute meadow fescue for perennial ryegrass in his seeds mixture.

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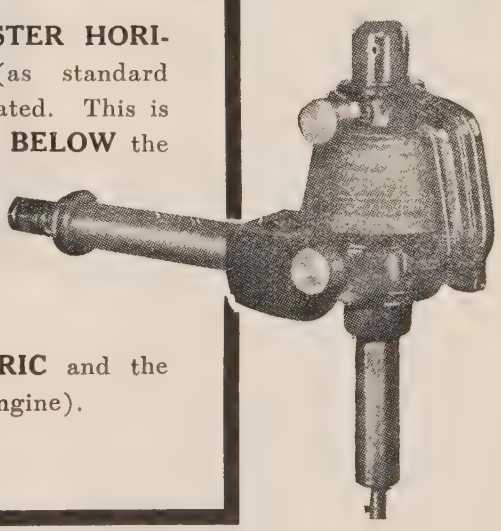

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BRANCHES AND AGENCIES THROUGHOUT NEW ZEALAND

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

The Dehorning of Calves

AT THIS season, when a new crop of calves is being reared on many dairy farms, the question of dehorning the calves frequently crops up. The majority of the dairy breeds of cattle in the Dominion are horned, and if a dehorned milking herd is desired the horn development in the young calves must be arrested or destroyed, or else the animals require to be dehorned at a later age.

There is no question of which is the better procedure, and again there is no question about the advantages to be gained from dehorning in the management and general production of a dairy herd. It is remarkable how the hornless beef breeds have been developed in recent years, so that today there are Polled Shorthorns and Polled Herefords, in addition to the long-recognised Polled Angus and Red Polled animals.

There is a distinct need for the development of polled dairy breeds, but, if these cannot be developed, there still remains the necessity of dehorning adult animals or of preventing the horn growth in the young calves. The large amount of damage to hides from goring, injury to udders, injuries from barbed wire indirectly due to goring, restlessness, nervousness, and lower production in such animals makes dehorning a necessity in a well-managed herd. The horned dairy bulls frequently become bad tempered with age, and many cases of injury to owners are recorded from time to time.

There is some reason for objection to dehorning in the case of pedigree animals, but there can be no objection in the case of grade herds. The best time to deal with the horn question is to begin with the young calf.

The Operation

There are several methods of preventing the horn growth, and any one of them may be used with equal success. When the calf is a few days old the horn buds can be easily felt with the fingers. The hair should be clipped off around the bud, and the rubbing of a moistened caustic soda or potash stick over and around the base of the bud will effectually destroy the horn-secreting tissue and prevent horn growth. In wet weather the caustic may be weakened and may run over the face; otherwise the operation should be quite successful. If in any doubt, a second application should be made at the end of a week.

If the calves are allowed to grow older before the operation is carried out the removal of the horn bud by

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means of a sharp surgical knife is recommended. First, clip off the hair around the horn bud, then raise the bud and skin with strong forceps and make a clean incision, removing the entire bud at its base. An application of Stockholm tar will prove useful in preventing bleeding and subsequent infection.

After a few years' treatment of heifer calves to be used for replacements in the herd the entire herd will be polled and the necessity for periodical dehorning of milking cows will be avoided.

Castration of Pigs

In order to avoid the formation of castration abscesses, strict cleanliness should be observed in the piggery when this operation is being carried out. It is necessary to clean the site of operation, to use a clean, sharp knife, which has been sterilised by boiling for a few minutes, and to place the pigs in a clean sty or a clean pasture afterwards.

The incision should be made sufficiently large to ensure good drainage from the wounds, no pockets being left where clots or infection may be imprisoned when the skin wound heals up. The incision should be made at the lowest point when the pigs are in the standing position, or at the highest point if the pigs are being held on their backs during the operation. This will assist drainage from the wounds.

It is advisable to castrate the pigs at the age of three weeks, as the wounds heal quickly in young pigs. Strong antiseptics, such as iodine, Jeyes' fluid, salt, kerosene, or sheep dip, should not be applied to the fresh wounds, as the burning effect causes the young pigs to endeavour to remove the irritant immediately and in too many cases directly contaminate the wound.

Use either a non-irritant antiseptic, such as chinosol, boracic in water, or none at all, or simply apply a dressing of Stockholm tar.

Post-castration abscesses should be avoided when these suggestions are followed.

Marking and Tailing of Lambs.

The same remarks as already referred to in the castration of pigs may be applied to the tailing and castration of lambs. Here, again, strict cleanliness should be observed in the use of the knife in the marking of lambs. Very serious abscesses in the purse have followed the use of a dirty knife or the making of too small incisions, which do not provide adequate drainage. In this respect the removal of the entire end of the purse, rather than making two incisions, has much to commend it.

It is said that such lambs do not provide a good cod when fat, but the removal of the end of the purse has much to commend it in regard to the reduction of scrotal abscesses and tetanus infection. Tetanus infection is rarely seen in a large, gaping wound; it is more commonly seen in punctured or healing wounds, when the infection is protected from the light.

It is a wise precaution always to use a fresh site for the marking of lambs. A few hurdles or a roll of netting wire should be used to provide a temporary enclosure for the operation. Old stockyards used year after year soon become heavily infected, and serious wound and joint infections have been contracted from such yards. Serious outbreaks of lameness and swelling of joints a few days after marking have been seen when old stockyards have been used.

Strict cleanliness and the use of temporary yards will do much to avoid lameness and thereby prevent a check in the lambs.

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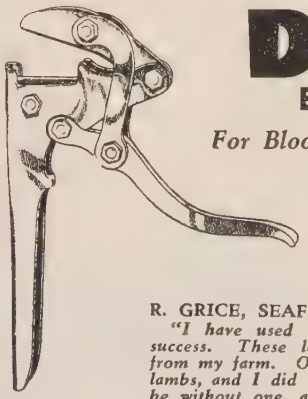

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R. GRICE, SEAFIELD RURAL, ASHBURTON:
"I have used the Daroux Emasculator on my lambs with great success. These lambs were the heaviest that have been delivered from my farm. Of a consignment of 332, most of them were wether lambs, and I did not lose one. My advice is that no farmer should be without one, and if they were £10, I would still buy a Daroux Emasculator, as they are worth their weight in gold."

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Lambs Fatten Earlier — Risk of Infection is Lessened

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Answers to Correspondents

Treatment With Cobalt

J.C. (No Address Given):—

I would deem it a favour if you would advise me on the undermentioned questions:—

(1) Would it be safe to add cobalt as a tonic to the nicotine bluestone drench for lambs (the drench is from your Department's formula)?

(2) Would it be advisable to use Joseph Ford's cobalt drench, or other proprietary drenches, alternatively with nicotine bluestone drench, say every 17 to 20 days?

(3) Will sea water kill stomach worms in lambs, and is it of any value as a tonic?

(4) What weight of cobalt would you require to add to a ton of fertilisers for topdressing grass land?

(5) Will your Department analyse soil for cobalt and lime deficiency free of cost?

(6) I have drenched the lambs this season with nicotine bluestone drench, and I have lost a lot through deaths. Would the mortality be caused by stomach worms, or a deficiency of cobalt or other minerals in the soil? Our soil is light, with a quantity of Rotorua pumice sand or ash throughout the surface soil. The altitude is from 1000 to 3000 feet above sea level.

ANIMAL RESEARCH DIVISION:—

As you have not stated your address it is not practicable to reply to you direct. The following are the replies to your questions:—

(1) Cobalt can safely be added to the nicotine bluestone drench for lambs, but if it is administered at intervals of longer than one week it is not likely to have any beneficial effect.

(2) No cobalt drench is likely to prove beneficial when administered at intervals of longer than one week.

(3) Sea water will not kill stomach worms in lambs, nor is it likely to have any value as a tonic.

(4) The weight of cobalt to be added to a ton of fertiliser depends on the rate at which the latter is applied. Experiments conducted by the Department have shown tnat sheep remain healthy in cobalt deficient areas where the pasture has been topdressed every autumn with five ounces of cobalt sulphate per ton of fertiliser. One hundredweight of this contains approximately five ounces of cobalt sulphate.

(5) The chemists of the Department of Agriculture will analyse samples for cobalt or other minerals free of cost when they are submitted through one of the Department's officers. With regard to cobalt deficiency, well-grazed pasture collected during the spring and liver from affected animals give a better index of the cobalt deficiency than soil.

(6) The particulars given do not permit of a diagnosis being made. It is suggested that the best course for you to pursue would be to consult the nearest Departmental Veterinarian or Stock Inspector, who would then make a thorough investigation of your problems and submit necessary samples for analysis.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

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Farm Practice and Management

Contributed by Officers of the Fields Division

Prevention of Buttercup Invasion

BUTTERCUP is a weed of wet land or of poorly managed pastures in high rainfall areas. As it is practically impossible to eradicate this weed by any but mechanical means once it becomes established in a pasture it behoves all farmers to take the greatest care to prevent the introduction of this pest.

It is on heavy clay land where pastures are winter poached that this weed will be most apparent. The town-supply dairyman's pastures or any other pastures which are, of necessity, heavily stocked in winter usually pug badly and in the spring produce vigorous crops of buttercups.

If the land must be heavily stocked during the winter the farmer must prevent his land becoming water-logged. The land must be well drained with subterranean drains to carry off surplus water and allow the soil to be aerated. Surface drains made with a plough (Fig. 2) are useless, as the drains are inefficient. Only part of the surface water is removed, and the adjacent land is pugged heavily by stock.

Fig 1.—Showing the ingress of young buttercups in badly pugged land.

Buttercup invasion can be controlled by adopting better winter management of pastures. This implies grazing fairly leniently and only at such times as a field is reasonably free from surface water. On the majority of farms buttercup infestation is peculiar to certain fields. If moderate grazing can be practised on these areas, the fields will come through the winter with a much better pasture covering. This in itself will materially assist in checking invasion by buttercup.

It is significant that buttercup is a weed of hard grazed and badly pugged fields, whereas good, close swards of ryegress-white clover are seldom affected seriously. Such good swards, however, are not obtained by the hard winter grazing of wet fields; rather are they the result of careful management over the winter period.—

—W. T. BROWN, Instructor in Agriculture, Hamilton.

Fig 2.—Pugged land with inefficient drains made with a plough.

AGROSAN G. IS SAFE

We wish to remind all grain growers that AGROSAN G has been tested by the Plant Diseases Division of the Department of Scientific and Industrial Research, the Seed Testing Station, Palmerston North, and the Canterbury Agricultural College, Lincoln. Official tests show that properly conditioned wheat, oats, barley, maize, peas and many other agricultural seeds can be dusted and STORED WITH SAFETY in a dusted condition for many months. In commercial practice Agrosan-dusted seed wheat, etc., can be stored for 12 months, and sown with perfect safety in the following season.

We wish to make clear that AGROSAN G is NOT the brand of "commercial pickling dust" referred to in South Island newspaper reports on June 24th and 25th.

AGROSAN G.

HAS STOOD UP TO ALL OFFICIAL TESTS

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Product of Imperial Chemical Industries

Disc Harrows As A Substitute For The Plough For Certain Purposes

A PRACTICE which is receiving attention and increasing in popularity is the use of the disc harrows instead of the plough when cultivating a field previously in turnips or chou mollier for sowing out in grass.

By this method a variety of purposes is achieved. In the south the bulk of turnip crops are fed off where they are grown, with the result that valuable animal residues are deposited at surface level, enriching the fertility of the surface layer of soil. Should ploughing be resorted to, this surface fertility is buried to such a depth that it is of no use in promoting quick pasture establishment, and of little use to the majority of surface-rooting grasses and clovers.

Not only does this occur, but the ploughing also has the effect of removing from the surface soil any lime which has been applied before ridging swedes. Many farmers in the south now make a practice of applying a ton of ground limestone before sowing swedes or turnips, as this assists in the control of club root, and, being slow-acting, it has sufficient time to be of use in promoting quick and vigorous establishment of clovers and grasses sown following the swede crop. Ploughing has the effect of removing the lime, which in any case has a natural tendency to percolate through the soil to a level at which it is of little use.

Further, in areas which are subject to grass grub attack it is apparent that the degree of consolidation of the soil is associated with the severity of attack. This contention is upheld by the fact that young pastures—i.e., those with the soil as yet unconsolidated—are more susceptible than older pastures, and that loose and open soils on the same farm and in the same district are more subject to grass grub attack than stiff clay soils.

A view of young productive pasture following turnips and sown after the fed-off crop had been disced.

(H. Drake, Photo.

Ploughing, followed by even the most effective cultivation, does not provide nearly as good consolidation as does the disc harrows, which merely penetrates the top two or three inches of the soil to provide a firm fine seed bed with a firm subsoil. This is more applicable to attack by subterranean grass caterpillar than to the grub of *Odontria,* or "brown-beetle."

In the case of a crop of swedes being sown on a field ploughed out of old pasture, such as browntop, little decomposition of turf occurs in the period during which the swede crop is growing, with the result that ploughing subsequent to the swede crop often brings up this turf which is difficult to cope with satisfactorily.

Swede and chou mollier crops are usually adequately intercultivated, with the resultant germinating and killing of weed seeds in the surface soil, so that a fairly weed-free surface is present, which is retained largely by discing, whereas ploughing brings up a new supply of weed seeds to be dealt with.

Generally speaking, the requirements of a good seed bed are fineness, firmness, and freedom from weeds, and these necessities can be adequately provided by disc harrowing after swedes, turnips, or chou mollier.

—A. F. GREENALL, Instructor in Agriculture, Balclutha.

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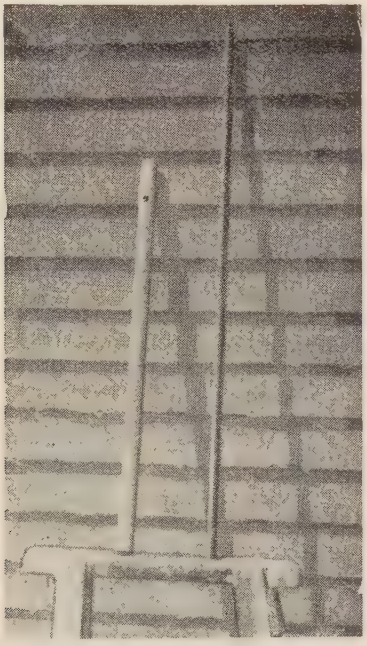

Fig. 1.—Showing a standard-driver made from a length of two-inch pipe and the difference in length between the driver and standard.

Fig. 2.—The driver in use. It is lifted by the operator and allowed to fall, driving the standard with its own weight.

THE accompanying illustrations show an ingenious and convenient method of driving standards.

The device for driving the standards consists of a length of two-inch piping, one end being filled with a plug of steel about 12 inches long. The steel plug is driven tightly into the pipe flush with the end, and held in position with a heavy rivet, which can be seen in Fig. 1.

The pipe is cut to a suitable length, so that when the standard is driven to the required depth the pipe touches the ground surface. This means that if the standard is required to be 3 feet 10 inches out of the ground the pipe should be 4 feet 10 inches long to allow for the 12-inch steel plug which is inserted in the driving end.

Fig. 2 shows the device ready for action. It is merely lifted by the opertor and allowed to drop on to the standard in the same manner as a pile driver. The standard is rapidly driven to the required depth by the fall of the loaded pipe.

—E. B. GLANVILLE, Instructor in Agriculture, Whangarei.

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Chou Moellier for the Dairy Herd

CHOU MOELLIER, which is a cross between thousand-headed kale and kohl rabi, is of fairly recent introduction into New Zealand. The area devoted to this crop is considerably below that of rape, being estimated at approximtely 11,000 acres for the whole of New Zealand, of which rather less than 2000 acres is grown in Canterbury.

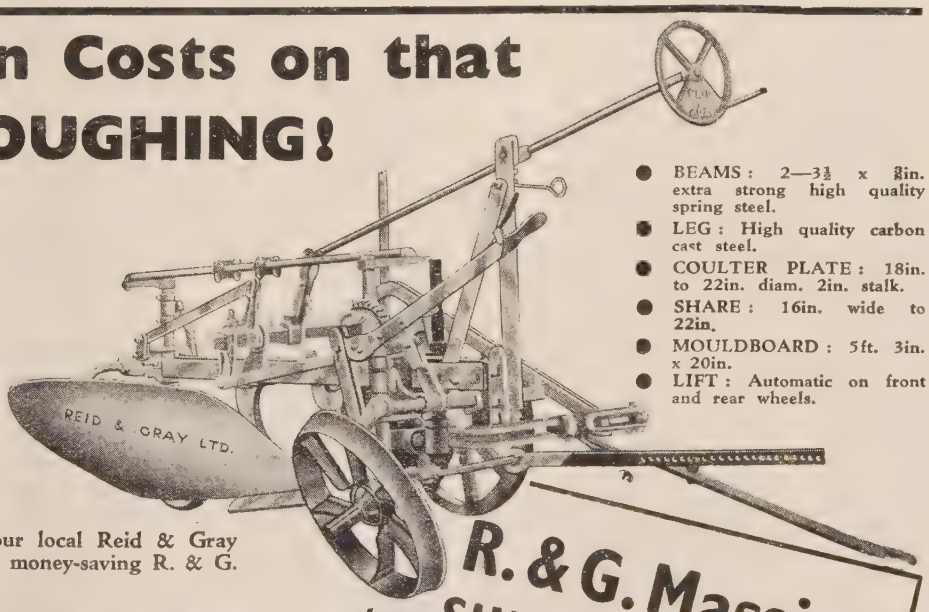
A crop of chou moellier grown for feeding out to a dairy herd.

On land subject to club root, chou moellier is a dependable crop, as although not immune to this disease, the crop is but slightly affected by it. Successive crops may therefore be grown on land subject to club root provided cultivation is thorough and the land adequately manured.

Although chou moellier is an extensive feeder and does best on rich loams well supplied with organic matter and responds well to good cultivation and manuring, crops quite satisfactory for grazing with sheep can be grown on most of our lighter soils under the usual methods of cultivation and manurial treatment adopted for rape and similar crops. It should be realised, however, that chou moellier is a slower fattener than rape.

Where the object is the production of a heavy yield on a comparatively small area, applications of farmyard manure may be used, in addition to

Bring Down Costs on that HEAVY PLOUGHING!



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- LEG : High quality carbon cast steel.
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- SHARE : 16in. wide to 22in.
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- LIFT : Automatic on front and rear wheels.

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artificial fertilisers, which may be applied prior to and at the time of sowing the seed at rates of up to 5 cwt. per acre.

When the crop is grown in Canterbury by the dairy farmer for feeding to stock in autumn and winter—this being the purpose for which the majority of chou moellier crops are grown—the usual method is to sow on the flat in rows up to 21 inches apart and to intercultivate. Wider spacings are at times adopted, but are not now general; nor is the practice of thinning the plants out in the rows so common as it used to be.

Seedings range from one and two to 2½ lb. per acre, the latter being sometimes adopted when the crop is sown through alternate coulters of the drill and fine-stemmed plants suitable for grazing with sheep are desired.

The accompanying illustration shows a crop of chou moellier grown by Dunlop Bros., dairy farmers, Ouruhia, and estimated to yield 45 tons per acre. It is understood that this crop itself received no special treatment although grown on land where fertility has been maintained at a high level over a period of years.

Fertilisers were pre-drilled and the seed sown in rows 20 inches apart. The crop received intercultivation, but, as can be seen, the plants were not thinned out in the rows. Although the definite quantity of seed sown per acre could not be indicated seeding was just sufficiently thick to ensure uniformity of plants in the rows without overcrowding. The result is a crop of the kind favoured by Messrs. Dunlop Bros. for feeding out to their dairy herd—leafy plants with comparatively soft stems which are readily consumed by stock.

—J. G. McKAY, Fields Instructor, Christchurch.

Pampas grass has proved highly successful as a fodder for dairy cows on a farm near Opunake. The farmer relates the following experience:—Three autumn-born calves were kept in the pampas nursery, and after being on milk for two months refused to drink, and lived on the pampas alone. Today these calves are bigger and better grown than those born 8 months previously and fed wholly on milk. This farmer is very enthusiastic about pampas and when his river bank planting is finished intends to plant 3 or 4 acres on flat land under cultivation.

Slaughterings of Stock

THE following return of slaughterings of stock at meat-export slaughterhouses and abattoirs for May, 1939, has been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat-export Slaughterhouses—						
Auckland	32,695	7,377	10,179	6,091	26,795	32,322
Poverty Bay-Hawkes Bay	9,937	4,992	60,591	12,153	66,748	4,233
Taranaki-Manawatu	15,839	1,224	35,613	14,901	83,268	23,227
Wairarapa-Wellington	8,741	1,653	22,187	9,940	54,373	4,104
Totals	67,212	15,246	128,561	43,085	231,184	63,886
Abattoirs	11,238	3,936	37,971	21,785	4,783	10,907
North Island Totals	78,450	19,182	166,532	64,870	235,967	74,793
South Island						
Nelson-Marlborough	340	4	4,854	1,624	18,292	1,162
Canterbury	1,707	1,401	113,699	82,269	314,171	3,595
Otago-Southland	1,458	64	47,971	28,251	376,826	732
Totals	3,505	1,469	166,524	112,144	709,289	5,489
Abattoirs	5,404	1,419	26,335	13,799	3,162	3,587
South Island Totals	8,909	2,888	192,859	125,943	712,451	9,076
Dominion						
Meat-expt. Slaughterhouses	70,717	16,715	295,085	155,229	940,473	69,375
Abattoirs	16,642	5,355	64,306	35,584	7,945	14,494
Grand Totals	87,359	22,070	359,391	190,813	948,418	83,869
May, 1938: Meat-export Slaughterhouses and Abattoirs	66,626	11,366	332,619	202,329	824,812	113,645
May, 1937: Meat-export Slaughterhouses and Abattoirs	71,914	11,847	324,262	169,450	918,777	129,198

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Care of Seed Potatoes

FARMERS will be busy at the present time in the preparation of their land for the potato crop, and in doing so their thoughts will naturally be on the seed to be sown.

August and early September are the two months when the potatoes which have been pitted or stored in sheds or bags should be graded. If they are left until late September and early October excessive sprouting takes place, to the detriment of the seed. If allowed to sprout unduly, even the best of seed will be very slow in striking.

Fig. 1.—Poor, spindly sprouted tubers.

For this reason it is necessary to grade the potatoes before much sprouting has taken place. All rotten, damaged, and ill-shaped tubers should be removed when grading, and the graded seed placed in a position where sprouting will be reduced to a minimum.

Fig. 2.—Potatoes with well-sprouted tubers.

Methods Described

There are several methods worthy of note. These have been tried by the more progressive potato-growers and have proved to be quite successful. They are as follows:—

(1) Sprouting in Shallow Trays: This method is ideal for the small grower and the home gardener, and also for those growers who make a practice of growing early potatoes. The potatoes are put in the trays about July, and are placed in a sheltered spot away from the cold winds. With this method, any potato that fails to sprout can be discarded, thus reducing the misses to a minimum.

(2) Spreading out the tubers one or two deep under trees and placing wire-netting over them to prevent injury from birds, etc. When the potatoes begin to sprout they are turned, and this prevents the sprouts from becoming too long. Just prior to planting. the tubers are bagged up and taken out to the field that is to be planted.

(3) Some growers grade the potatoes into the sizes required. They are then bagged up into manure bags and stacked under trees or in an open shed giving plenty of ventilation and sunlight. The heap is moved about every fortnight or three weeks, depending on the weather conditions.

(4) Others, again, spread the potatoes out on the grating of the

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Fig 3.—Potatoes with non-sprouted tubers.

woolshed after grading and turn the tubers periodically or cart them out to the paddock that is to be sown and space them along the fence. They are periodically turned over to prevent the bags from rotting, and also to prevent the tubers on the bottom side from sprouting too much.

Trouble Well Paid For

The idea behind all these methods is to prevent excessive sprouting of the tubers, which reduces the vitality of the seed.

Farmers who put some of these practices into use will be more than repaid for their trouble, in that the seed will be in excellent condition when planting commences. Planting can be delayed, if necessary, under these methods, and, further, it will be found that the crop comes away more quickly.

—*C. C. LEITCH, Instructor in Agriculture, Timaru.*

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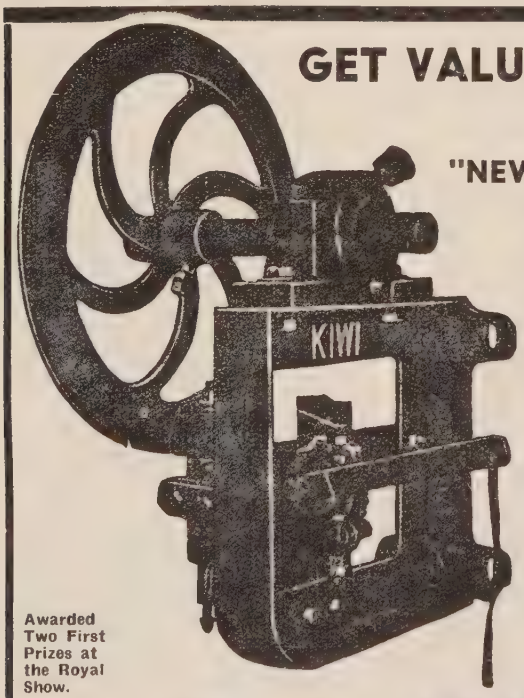

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Horticultural Instruction

Contributed by Officers of the Horticulture Division

Orchard Notes

Pruning, Cultivation, Spraying and Manuring

NOTES in the two previous issues of the "Journal" have dealt with pruning of both stone and pip fruits. Efforts should be made to complete the pruning as early as possible, to gather up all prunings, and, in general, to clean up the orchard in preparation for the spring work of cultivation and the application of early sprays. This work is often hampered through the pruning becoming too protracted, and any delay in bringing the orchard land into good tilth by the time growth begins is reflected in weaker foliage shortly after trees come into leaf.

It is important that all prunings should be gathered up and burnt, either as pruning proceeds or when the work is finished, as a common-sense sanitary measure in reducing sources of infection for orchard pests and diseases. Spraying of stone fruit often begins by the end of July, so that it becomes very necessary that at least this portion of a mixed orchard should be cleaned up early.

Where regular applications of fertilisers are required, certain materials should be spread prior to ploughing. It is necessary, therefore, to work well ahead in planning orchard work, so that the various operations may be done in correct sequence if the most economical working of the orchard is to be secured.

Early Sprays for Stone Fruit

The new season's spraying programme begins with applications of insecticides, mainly for the purpose of destroying scale insects and red mite eggs. For this purpose red oil at a strength of 1-20 is commonly used. It is necessary to use oil at this strength before any pronounced bud movement in order to avoid damage to the buds. Most stone fruit trees are still in a fit state for spraying by the end of July.

The most important scale insect to be dealt with is the San Jose scale. Every effort should be made to combat this pest, as its spread is very rapid and most destructive. Badly-infested portions of trees should be cut out at pruning and destroyed, while the remaining portions should be sprayed so thoroughly that no part of the tree is missed.

Complete coverage is an essential factor in securing disease control, and any expenditure on improvements in spraying equipment which will give better coverage and consequently better disease control is usually a capital expenditure which will return a profit. Fruit trees carrying a heavy deposit of red mite eggs should be sprayed with red oil to destroy the eggs, thus securing a period of freedom from red mite attack in the earlier part of the new growing season.

Peach Leaf Curl

To prevent peach leaf curl and other stone fruit diseases, Bordeaux mixture 5-4-50 should be applied when the fruit buds begin to swell and the bud scales lift. It is particularly important in leaf curl control that peaches should be sprayed before the terminal leaf buds break and the tips of the developing leaves become exposed.

Manurial Treatment

Fruit quality and fruit tree yield may be greatly influenced by manurial treatment. Fruit trees withdraw from the soil quantities of plant food each year, and unless the withdrawals are replenished or deficiencies in any particular plant food are supplied artificially there must inevitably be a decline in growth and yield. Fruit trees require the common plant foods—nitrogen, phosphoric acid, and potash—for normal tree growth and fruit production.

Deficiencies in any one plant food affect trees in different ways. A deficiency in nitrogen would be evidenced in a restricted foliage development, premature defoliation, and general lack of vigour. Where the potash supply is low, a characteristic symptom is a scorching of leaf edges and a reduction in leaf size.

On land rich in humus (and therefore well supplied in nitrogen) additional nitrogen applications would be dangerous in adversely affecting the keeping quality of fruit and the grading results in coloured varieties. Fruit from trees on poorer soil types with a deficient nitrogen supply are of better keeping quality and are the more highly coloured. However, trees under these conditions stagnate unless an adequate nitrogen supply is made

available. Nitrogenous fertilisers are indispensable, but they should not be supplied in such quantities as might adversely affect the keeping quality of fruit to an appreciable extent.

Balance Necessary

It is necessary to keep a balance between the various nutriments present in the soil to secure the maximum results in quantity, while at the same time maintaining quality. Normal applications of fertilisers on the poorer soil types, which constitute such a large proportion of the total fruit area in New Zealand, would be 4cwt superphosphate, 2cwt sulphate of ammonia, and 1½cwt potash per acre, or alternately 6cwt of blood and bone with the additional potash.

With the exception of sulphate of ammonia, which should be applied as a dressing around the trees when the buds are breaking, the fertilisers should be applied before the deepest ploughing and thus be placed in the soil as deeply as possible.

It is an advantage where growth and vigour over an area are extremely variable because of undulations to be able to vary the nitrogen application to meet the requirements of individual trees. In such cases trees in the hollows making vigorous growth would require little, if any, additional nitrogen, while others would require heavier dressings.

Apart from the direct application of these essential plant nutriments, occasional applications of lime are necessary to improve the physical condition of certain lands, and on those lands deficient in humus it is necessary to make provision for the growing and turning in of cover crops. Lime should be applied after ploughing, and under average conditions one ton of carbonate of lime to the acre should be a satisfactory dressing every third year.

—N. J. ADAMSON District Supervisor, Nelson.

Stages of blossom development of the peach—(1) dormancy; (2) bud movement; (3) pink; (4) full bloom; (5) petal fall.

[Drawing by N. J. Adamson.

Citrus Notes

Important Features of Picking

MOST citrus growers are fully occupied in harvesting their crops at this season of the year. Full details as to the care and precautions necessary in picking were set out in the last issue of the "Journal," but some special mention is still required regarding certain features.

Although most growers realise the manner in which the second cut should be made, it is surprising to note the number of lemons received at the citrus depots with the button injured in some manner. In most cases the centre of the button has been pulled out. This is often due to unsuitable secateurs or secateurs which require sharpening. Some pickers do not cut sufficiently close to the button, and this is also often due to the secateurs rather than to lack of knowledge on the part of the growers.

Growers have constantly been requested to undertake a preliminary

culling of fruits at the orchard, but the number of distorted fruits still received show that this is still not common practice. The best time to do this culling is when picking, and it is advisable to drop such fruit into a separate container and later bury such fruit. No diseased fruit should ever leave a citrus orchard; it should be destroyed by burning or burial.

Brown Rot

Brown rot is often troublesome in orchards where fowls are permitted to run. The leaves of the trees become brown and wilted, small dead areas may be seen on the laterals, and fruits turn a greyish brown and emit a pungent smell. This disease is caused by a soil fungus which can thrive only in the presence of moisture. Control consists in pruning the trees well clear of the ground and either stirring the soil continuously or, preferably, sowing a cover crop under the trees to prevent the spores of this fungus from being splashed by rain on to the foliage.

Bark blotch and collar rot are two common fungus diseases which cause considerable damage to mature trees. Both attack the lemon, but collar rot also attacks the orange. Bark blotch is chiefly a wound parasite; the bark becomes dead and flakes off, but no gumming is evident. All sources of infection must be pruned away and burnt and the underlying tissues painted with a disinfectant solution. The most convenient and readily prepared is Bordeaux paste, which is made as follows:—

Bluestone, 1 lb.; quicklime, 2 lb.; water, 1½ gallons. Dissolve the bluestone in half the quantity of water and slake the lime with the remainder. When slaking has ceased, stir the lime mixture into a stiff paste, at the same time slowly adding the bluestone solution. Apply with a brush.

Collar rot, on the other hand, is associated with copious gumming; the bark becomes discoloured, and a disagreeable odour is emitted. It frequently occurs on poorly drained soils. The treatment is identical with that for bark blotch, but drainage must also receive attention and the crown of the tree must be exposed.

Frost protection is important at this time of the year on certain orchards, and citrus growers in districts susceptible to frost injury are advised to read the article on the "Prevention of Frost Damage in Orchards" by Mr. W. R. Williams in the March issue of the "Journal."

Marmalade Oranges

The picking of marmalade oranges will now be proceeding. Fruits should be completely coloured on the tree. Do not brand this early fruit "New Zealand Grapefruit," as it is too immature for grapefruit purposes and will merely act to the detriment of this valuable fruit, which is steadily meeting increased demands.

One operation which requires to be emphasised at this time of the year is observation as to the difference in quality between the fruits from trees. Even if a detailed plan of the orchard has not been prepared, all trees bearing poor or off-type lemons, small poorman oranges, or excessively blemished fruit should be recorded so that the necessity for top-working certain trees may later be considered.

For those lemon growers who are aiming to produce a "peel lemon" of quality, the time to pick is when the fruit is up to size and fully coloured, but do not leave the fruit until it is nearly tree ripe. Many valuable peel lemons are wasted through being allowed to hang too long on the trees. Such fruit cannot be made into good peel, as it collapses in the manufacturing process.

L. PAYNTER, District Supervisor, Auckland.

Viticulture

Phylloxera—Resistant Stocks

(*Continued from June Issue*)

OF THE other Berlandieri hybrids in the Te Kauwhata Horticulture Station vineyard the following are recent introductions, but have not yet been under observation long enough to form a considered opinion on their behaviour in New Zealand, though they were all chosen because of the favourable reports in the countries of their origin and adoption:—Berlandieri x Riparia 261-5 (Couderc), 8.B. Teleki, 5 B.B. Teleki (Kober's selection), and Riparia x Berlandieri 161 x 49.

The last-named is being used on a considerable scale by vine nurserymen in France, noticeably for grafting such of the direct producers (American x Vineferas) as require grafting because of insufficient resistance to phylloxera or for improving the output or quality. It is said to be particularly suitable as a stock for varieties that do not marry well with stocks containing Rupestris blood.

Tobacco Notes and Cool Storage Notes on Page 66.

Because of their recent introduction, the same remarks apply to the Cordifolia hybrids. The stocks of this type introduced are:—Riparia x Cordifolia—Rupestris 106-8, Riparia x Cordifolia 125-1, and Rupestris x Cordifolia 107-11.

All these were hybridised by the French viticulturists Millardet and de Grasset.

These stocks are very vigorous, and are recommended for stiff soils, low or lacking in lime content, and becoming hard in summer, such as the type of soil in the State vineyard and other parts of the Auckland Province, generally known as gumlands. They should also prove valuable for the soils of the Moutere Hills.

Of the three stocks, the 106-8 has generally given the best results in France and Algeria in congenial soils, and, judging from the growth made in stiff soil at Te Kauwhata, good results can be expected here.

(*To be Continued*)

—J. C. WOOFIN, Vine and Wine Instructor, Te Kauwhata.

Vegetables, Small Fruits and Flowers

Contributed by the Horticulture Division

Vegetables and Culinary Fruits

SEED TIME and harvest are proverbially busy periods in agriculture. The former now commences in earnest, and to obtain good results the work must be done during favourable weather and when the soil is sufficiently dry. During the spring such periods are comparatively rare, and the utmost advantage should be taken when they do occur. It is for this reason that land under intensive cultivation should be well drained, and if it is on the light side it is an advantage, especially where early crops are grown or the summer crops are of the class known as half hardy.

Where the land has been well prepared, as previously advised, by suitable cultivation and supply of the necessary humus and lime as required and also by clearing it of perennial and annual weeds and allowing it to settle, in most instances a moderate dressing of fertilisers worked in is all that is required before sowing and planting may be done in the most satisfactory manner.

Optimum Amount

In the use of these fertilisers at this stage practice differs rather widely, some applying a ton or more per acre, equal to about ½lb. per square yard, and others about one-quarter of that amount, the former being of the opinion that what is not used by the ensuing crop will be available for crops which follow. It should be remembered that in practically all quantitative experiments with fertilisers there is an optimum amount, to exceed which results in a loss of crop and not an increase on that resulting when the optimum quantity is used.

The value of most of these fertilisers lies in their solubility, which makes them readily available, and moderate dressings—repeated at intervals, if necessary—are generally the most suitable method of application, especially on a soil which is inclined to be light.

Plantings and Sowings for August

In most districts in this country the following crops may be planted during August. Results will depend very largely on good preparation of the land and planting when the soil is sufficiently dry to be friable.

Asparagus, rhubarb, early potatoes, artichokes, cabbage, cauliflower, lettuce, autumn-sown onions, and, in the unheated glasshouse, tomatoes.

Important sowings at this season are:—asparagus, to produce strong, one-year-old crowns for planting out twelve months hence, early peas, broad beans, early carrots, parsnips, globe beet, early turnips main crop onions in the drier districts, lettuce, radish, spinach, parsley, cabbage cauliflower, and, towards the end of the month and under glass, tomatoes, celery, melons, cucumbers, marrows, egg plants and peppers for planting out when spring frosts cease.

The kind and amount of fertilisers to be used with annual crops is ascertained by consideration of the behaviour of previous crops, more particularly the last, of the soil and its condition in the light of recent treatment, and the special requirements of the crop about to be planted.

Fertiliser Requirements

Such root crops as carrots, parsnips, beetroot, turnips, and radishes require, principally, phosphates, with a liberal supply of potash and small quantity of nitrogen. On land well manured for the previous crop and deeply cultivated since the following fertilisers may be broadcast per acre and well harrowed in before drilling the seed:—

4 to 5cwt. of superphosphate,
2cwt. sulphate of potash,
1cwt sulphate of ammonia.

For such crops as potatoes, artichokes, onions, leeks, and shallots, the requirements are principally potash, with moderate supply of phosphates and small amount of nitrogen. For these the following fertilisers may be incorporated per acre before sowing:—

3cwt. of superphosphate,
2cwt. sulphate of potash,
1cwt. sulphate of ammonia.

Crops requiring principally nitrogen with a liberal supply of phosphates and a small amount of potash are cabbage, cauliflower, rhubarb, spinach, and celery. A dressing of fertilisers per acre for these crops shortly before planting would often be:—

4cwt. superphosphate,
1½cwt. sulphate of potash,
1cwt. sulphate of ammonia,

with side dressings of nitrogen later as required.

Requiring phosphates and potash with small amount of nitrogen are such crops as peas, beans, marrows, pumpkins, lemons, cucumbers, and tomatoes. For these a suitable dressing per acre at this stage will often be:—

3cwt. superphosphate,
2cwt. sulphate of potash.

These prescriptions are merely given as a guide for those with little local experience with the use of fertilisers for these crops. The experience gained should be closely watched and recorded so that adjustments can be made to more closely meet local conditions. As regards quantities, it is to be remembered an ounce per square yard is equal to about 2½cwt. per acre.

Towards the end of August new spring growth will begin in most districts, and the root crops, such as parsnips, etc., remaining in the ground must be lifted and stored in a cool place before their flavour is spoiled through second growth taking place.

To stimulate the growth of the crop of spring cabbage a moderate dressing of nitrogen should be applied when growth is about to begin and lightly worked in. It will generally be advisable to repeat this dressing a few weeks later.

Where mushroom crops have been started, care is necessary to prevent the establishment of insect pests. Following up the thorough cleaning of the shed, fumigation, and planting, it is necessary to use pyrethrum and derris powders or sprays at intervals of a few days to enable control of these pests to be maintained. Applications should be made when the beds are being straightened up after picking.

Treatment of Common Troubles

THE MORE common troubles here include gooseberry leaf-spot, *Mycosphaerella Grossulariae* which also affects currants. For this an application of Bordeaux 5.4.50 should be applied when the leaves are unfolding, and repeated at about monthly intervals at a strength of 3.4.50 as required.

A "cane-blight" causing branches of gooseberries to die back is caused by a fungus *Botryosphaeria Ribis*, which also affects currants. The remedy is to cut out infected wood well beyond the point of infection and sterilise the wound. As the trouble is chiefly spread by means of insects, these should be controlled where and when necessary by light dustings of derris.

Where trouble is experienced with raspberry cane-wilt, a disease due to *Leptosphaeria Coniothyrium*, the new canes should be sprayed at bud movement with Bordeaux 5.4.50 and repeated at intervals at a strength of 3.4.50.

Because of the trouble caused to strawberry crops by the leaf-spot fungus, *Mycosphaerella Fragariae*, Bordeaux 3.4.50 should be applied in early spring and a good cover maintained.

To prevent the attack of the native bud-moth, *Carposina adreptella*, in districts where it is troublesome raspberry breaks should be sprayed with arsenate of lead in the spring when growth begins.

Black Currant Eelworm

Black currant eelworm is causing growers anxiety in some districts by destroying the buds. The variety known as Daniel's September seems to be particularly susceptible. The insects live between the bud scales, and require the presence of films of moisture to enable them to migrate on the surface of twigs and shoots, being unable to travel on dry surfaces.

Badly infested parts would be better cut out and burnt. Avoid touching healthy growth after handling infested twigs, and also avoid handling wet bushes. Cuttings for propagation should be taken only from healthy bushes.

Satisfactory control has not yet been established, but the constant use of lime sulphur has been recommended. It may be tried first at a strength of 1/20 before the buds begin to break and afterwards at intervals at a strength of 1/120; or nicotine sulphate 1/400 may be used. This is a comparatively new pest, and until further trials have been made these spray formulae should be used experimentally.

It should be remembered the life of these plants is about ten years, after which they should be dug out and burnt. Meanwhile, new plantations should be made on fresh land. Also, in the performance of all operations the younger and healthier plantations should be dealt with first, so that infection may be avoided so far as possible.

Pruning Roses

IN THE colder localities in this country roses are pruned towards the end of August, or even early September, with a view to delaying the new growth until the period of hard frosts is past. It is otherwise susceptible to serious injury in such localities.

Herbaceous borders requiring a periodical overhaul may now have the plants lifted and the land reconditioned before replanting. This attention is necessary at intervals of three or four years. Many excellent hardy annuals may now be sown outside and half hardy annuals in boxes in sheltered frames. Large weeds should be removed from lawns; they will draw easily after rain if some of the main roots are cut with a long knife well below the crown.

Planting Shrubs

The planting of trees and shrubs should now be done as soon as conditions permit. The end of September is about the limit for this class of work. Climbing plants newly set at the base of a wall often require watering in and attention throughout the summer to see they do not suffer from want of water.

Standard trees and roses should be securely staked, setting the stake in position before planting and tying it firmly and neatly afterwards. Strips cut from cycle or motor tyres make suitable ties. The tie should be placed round the tree and the ends crossed

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before bringing them round the stake and nailing them to it with felting nails.

Where new lawns are to be sown down, August is usually a suitable time. In dry localities it is important to sow early. The land must be in good condition for the work, and a windless period is necessary for broadcasting the seeds.

Small Fruits and Nuts

THE planting of hardy small and sundry fruits should now be carried out as soon as possible when the land is in condition.

Currants, gooseberries, and raspberries, chestnuts, walnuts, almonds, and hazelnuts, and, in the warmer districts and localities, figs, persimmons, mulberry, feijoa, Chinese gooseberry, and loganberries may be planted, deferring until about October the planting out of Cape gooseberries, tree tomatoes, and passion fruit. The hardwood plants, especially, should be carefully pruned after planting, so that they will grow strong and thrifty without any delay.

—Wm. C. HYDE, Horticulturist, Wellington.

Experiments With Fertilisers and Manures

A REPORT is to hand from Long Ashton Research Station regarding an experiment carried out recently in the manuring of raspberries. The treatments included (1) No manure; (2) farmyard manure, 10 tons; (3) complete organics (dried blood, bonedust, sulphate of potash); (4) complete inorganics (nitrate of soda, superphosphate, and sulphate of potash); (5) complete mixed organic and inorganic manures, as detailed above; (6) as in No. 5, but without nitrogen; (7) as in No. 5, but without phosphate; (8) as in No. 5, but without potash.

In all treated plots, except those receiving farmyard manure 10 tons per acre, nitrogen was used at the rate of 50lb. actual nitrogen per acre, phosphate at 120lb. total phosphate — approximately 60lb. P_2O_5 (phosphoric acid) per acre, and potash at 100lb. K_2O (oxide of potassium — actual potash) per acre. The manures were applied in broadcast fashion during the spring, the farmyard manure not being specially turned in.

The growth throughout the plots was good, excepting those under potash deficiency and to some extent those under nitrogen deficiency. The potash deficiency symptoms, present in plots under the first and last treatment mentioned above, were quite typical, beginning as a slight purpling, followed by brown tinting of the leaf margins, which eventually dried out, producing marginal scorch and extending later towards the midribs between the veins.

The treatments were duplicated. On Block A the crops were:—(1) Plot 7 with 112.15 kilos; (2) plot 5 with 110.15 kilos; (3) plot 2 with 107.07 kilos. "No manure" plot carrying 79.69 kilos, and plot 8 with potash omitted 75.5.

On Block B the crops were:—(1) Plot 5 with 109.99 kilos; (2) plot 4 with 107.23 kilos; (3) plot 2 with 102.86 kilos. "No manure" plot on this block carried 50.6 kilos, and plot with potash omitted 52.48.

The increase in the crops of fruit in the two blocks due to the manures and fertilisers are, on the whole, similar to those for cane growth.

A previous experiment on the same lines had been carried out with a crop of gooseberries. The results were generally similar to those described above for raspberries, potash deficiency injury being the chief problem in both cases. Nitrogen deficiency effects were observed with raspberries when that ingredient was omitted, but not with gooseberries.

Tobacco Notes

Sowing the Seed

TOBACCO-GROWING land in the Nelson Province is now mostly ploughed and lying fallow for the beneficial action of frost and winter conditions. No outside work is in progress at the present time.

Nurserymen are engaged in the sowing of tobacco seed in glass houses, preparing for delivery to growers early in September. Outside seed beds which are to be sown broadcast will not be sown until August.

Farmers who sown their own seed can make a useful contrivance for the fine, even distribution of these minute seeds by piercing the lid of an aspirin bottle with a small tack. Put the required amount of seed in the bottle and sow with a shaking motion lengthwise, crosswise, and, if seed is still showing in the bottle, diagonally over the bed. The time spent in this sowing the space three times is well worth while, as seed sown too thick in patches is quite useless.

—CHARLES LOWE, Tobacco Instructor, Motueka.

Cool Storage Notes

Inspection of Fruit

WINTER COLE pears generally are in an attractive, clean condition this season, which suggests that black spot has not been as troublesome this season in many of the fruit-growing districts. A few consignments of this variety, however, have shown heavy russeting, which seems to point to the application of a spraying programme which has more than efficiently dealt with this troublesome fungous disease.

Many growers in other fruit-producing countries have found that care is necessary when spraying with various chemical mixtures, as severe injury to the fruit may result. Frequently, the result of a slight injury from the chemical action will not become apparent until some time after picking and placing the pears in cool storage. Shrivel and markings are then found to have affected the appearance of the fruit. Fungal rotting also develops from this type of injury.

During the months of July and August an inspection of all fruit held in cool storage should be systematically carried out, as losses will be avoided if tendencies towards breakdown are detected at an early stage of development.

The large sizes of most varieties of apples should be examined frequently, especially if the fruit was picked from trees carrying a light crop.

All lines of apples which were allowed to become too fully matured before being placed in the cool store should now have been disposed of.

Blowing out of the chambers should be carried out at regular intervals—at least twice each week.

—A. POWELL, Cool Storage Officer, Wellington.

APIARY NOTES

Contributed by Officers of the Horticulture Division

Moving Bees to a New Site

WORK among the bees should cease at this time of the year almost throughout the Dominion. As July is one of our coldest months it is necessary to conserve the warmth of the hive and avoid disturbing the bees, which will now be formed into a close cluster in the centre of the hive. To break this cluster on a cold day may do serious damage. There are parts north of Auckland, however, where the climate is mild and the ti-tree is coming into blossom, where little danger would accrue if hives were opened even in July.

Moving the Bees

Exception to the above general rule of non-disturbance of the colonies may be made, however, where it is necessary to move an apiary from one locality to another. July would probably be the best month of the year for this operation. At this time there will be very little brood in the hives and, the bees being numerically weak, there would be little or no danger of overheating, as is sometimes the case when moving bees in warm weather.

Nor would there be the danger of loss of field bees when shifted short distances because at this period the flights of the field bees are comparatively short and often for days they are confined to the hives by bad weather. Thus, they do not have the opportunity of taking their bearings to the same extent as during the warmer seasons.

Where the new site is situated more than three miles away there is little likelihood of the bees returning to the old stand, even if shifted in the spring or summer. Bees rarely fly more than a mile from their hives if food is available within that distance, but, should there be a scarcity, they have been known to fly as far as four miles to reach nectar in the spring and summer.

Securing the Hive Body

All that should be necessary in order to move bees at the present time is to secure the hive body safely to the bottom board and to the cover, making sure that they have no other outlet than that provided at the entrance. This can now be covered with a strip of wire cloth, so that the bees are strictly confined.

During cold weather this should be sufficient ventilation for any but very strong colonies; nor should there be any danger of the combs of honey breaking down and smothering the bees, as would be the case in warmer weather unless extra ventilation were given.

The use of crate staples will be found most effective for securing the hives to the bottom boards, but where overlapping flat roofs are in use a two-inch nail can be driven through the ends of the cover. They should, however, project sufficiently to allow them to be gripped by a claw hammer to facilitate their removal later.

In moving long distances more precautions may be necessary. If the hives are fairly strong and well filled with combs of honey it would be safer to secure the frames from rocking or moving to one side and crushing the bees. To do this would necessitate doing the manipulations in the day time, but all parts could be secured except the entrance. This could be left until all the bees had settled down, and then fastened the evening before the day of removal.

Extra Ventilation

If the bees are likely to be confined for a day or two it would be advisable to give extra ventilation by placing a wire screen on top of the frames, removing the mat for the time being. The screens can be made by using narrow laths nailed together to form a frame of the same dimensions of a hive body and then covering them with wire-cloth. These can be nailed on with 1½-inch nails, or secured with crate staples.

On arrival at their destination the hives should be placed on their stands and not opened or disturbed for an hour or two. Towards evening, or when it is nearly dark, the entrances can be quietly opened and left for a day or two before finally removing the screens.

In these days of motor transit the moving of bees from one locality to another is not nearly the trouble or danger that existed in the time of horse-drawn vehicles.

One matter which should receive consideration, however, is the accessibility of the new site to motor traffic. It is sometimes necessary to move the bees across grass paddocks, and in such cases a heavy motor-truck is liable to become bogged in wet weather. Where there is such a danger it would be advisable to arrange for a horse-drawn sledge to be made available for moving the bees from the road across any wet paddocks.

This will, of course, entail a much greater amount of work, but much

time may be saved by taking these precautions if the soil is saturated with moisture. It would be better, if possible, to wait for a few dry days if by so doing there is a possibility of driving right to the apiary site.

Winter Overhaul

Even though it may be the slack time so far as the bees are concerned, bee-keepers can generally find sufficient work to do in the workshop in overhauling hives and covers, repairing any leaky ones, and nailing together new hives and painting them or repainting old ones requiring attention. The preparation of sufficient new frames for the coming season will then require attention.

In commercial apiaries the working plant of the apiary should be overhauled. The engine and extractor should also be examined and cleaned, and attention given to all appliances to see that they are in good working order for the next season.

The rending of old combs and wax should now be done, and what is required for foundation should be sent to the foundation factory or made into comb foundation by the bee-keeper where such is done at home.

The frames can be made up and wired, but it is better to leave the fitting in of the foundation wax until a little later on. At this time of the year the wax is rather brittle and, unless great care is taken, can be easily broken. August, or even September, would be time enough to complete the frames, provided all other necessary preparations were made.

—G. V. WESTBROOKE, Apiary Instructor, Hastings.

Book Review

"Scientific Horticulture"

BY A RECENT English mail we received a copy of "Scientific Horticulture," Volume VII, 1939.

This publication contains a number of contributions by prominent workers in horticulture of interest to the progressive horticulturist. The issue contains contributions by horticultural research workers at the annual conference held at the East Malling Research Station, Kent, last September.

Subjects dealt with include "Rootstock Work at East Malling," by R. G. Hatton, C.B.E., M.A., D.Sc., V.M.H.; "Winter Pruning Trials with Apples at East Malling," by N. H. Grubb, M.S.A.; "Practical Methods of Frameworking Fruit Trees," by R. J. Garner, N.D.H., and W. F. Walker, of the East Malling Research Station; "Plant Injection for the Diagnosis of Mineral Deficiencies," by B. F. G. Levy, B.A.; "Researches into the Cause of Frost Damage," by C. E. Cornford, B.Sc., A.R.C.S.; "Results of Researches in Strawberry Growing," by W. S. Rogers, M.A., M. E. King, B.A., and A. M. Massee, D.Sc.

"Commercial Horticulture in Eire" is dealt with by G. C. Sherrard, M.C., A.R.C.Sc.I., Lecturer in Horticulture, University College, Dublin, and "Seed Potato Growing in Eire" in an article by W. D. Davidson, B.A., Ph.D., A.R.C.Sc.I., N.D.A. S. R. Mullard, M.B.E., M.I.E.E., and R. H. Stoughton, D.Sc., supply an article on "Preliminary Trials in Growing Horticultural Crops in Nutrient Solutions."

There are also other contributions of scientific and practical importance.

The volume which is appropriately illustrated extends to 212 pages and is published by the Horticultural Education Association, Great Britain.

Blight on Artichokes

L.R.W. (FRANKTON JUNCTION):—

I have a crop of artichokes planted seven years ago which are now badly blighted. They still grow foliage up to 10ft high, and are very thick, with nothing underneath. Can you advise me how to combat this blight, which has been creeping in for the past two years? These artichokes are growing in an orchard about two acres in extent, and are treated with one ton of lime and one ton of super or slag every year. The land is also ploughed and worked and resown where the pigs have thinned them out.

HORTICULTURE DIVISION:—

Seven years is a very good run for this style of cropping. The artichokes should now be eradicated and the land given a rest. Another crop may be grown from clean seed on new land. Preferably, a good light soil that is well drained should be chosen.

International Essay Competition

The International Dairy Federation after consultation with experts in various countries has decided to conduct a prize competition for the best work on the following subject: "The most practical method of evaluating the records of milk and fat production in order to settle the heredity of a cow as regards both milking and butterfat capacity as soon as possible."

Competitors should include in their essays a critical discussion of the various methods of excluding all non-heridity influences on production (i.e. environment) in order to obtain a clear view of such achievement. Essays should also show how it is possible for practical breeders to concern themselves with these problems without becoming involved in too great difficulties, the idea being that it should be possible for breeding associations and for individual breeders, by means of simple, practical and economical methods, to obtain a more exact idea of the hereditary capacity of an animal, and, above all, to be in a position to form a clearer judgment as to the breeding value of young animals, and especially of bulls, at an earlier stage, than has hitherto been possible. If the process is to be of practical value and easily understandable by breeders, who are accustomed to work with absolute production figures, no use can be made of complicated calculations based on such figures.

The competition is open to everybody. Entries should be submitted in English, French, German or Italian, and should not exceed 500 lines of text. (Illustrations and tables are not included in the 500 lines.)

Intending competitors must submit their name, their country and their full address to the Secretariat General de la Federation Internationale de Laiterie, 63, rue Joseph Bens, Uccle-Bruxelles, Belgium, not later than August 31, 1939, while the essays themselves must reach the above address not later than October 1, 1939, accompanied by the above information and signed by the competitor in his own handwriting. The first page should bear the words "PRIZE ESSAY," and the full title of the essay.

The total value of the prizes to be awarded amounts to 5,000 Rm. (approx. £500). The essays will be examined and the prizes awarded by a jury to be selected by the International Dairy Federation.

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Internal Organs of a Fowl

THE INTERNAL organs of a fowl are well explained in the accompanying illustration, and the functions of the various organs are briefly as follows.

The crop is really a storehouse for food during the time of feeding, and as it is required by the stomach the food is gradually discharged from the crop by the contraction of its muscular walls. In grain-eating birds the crop is larger than that of such birds as ducks and geese, which feed largely on grass, for in the latter class the oesophagus is enlarged and is used for the same purpose as the crop is by granivorous birds. The period that the food remains in the crop depends upon the nature of the food eaten. Animal food is at times retained about eight hours, and some vegetable foods may not pass on for sixteen hours.

It is well known that the heart is the central pumping station and that this all-important organ propels the blood to every part of the body. It should be of a deep red colour without marbling, but it very often has a little fat on the tip.

The gizzard, or muscular stomach, is really a powerful little grinding machine. It consists of three thick, tough coats, and by means of powerful fleshy muscles—together with hard grit, which acts like mill-stones—the food is ground into pulp. It is of a deepish red colour outside, shaded into a bluish-green, with a white, ribbon-like border on the ends, usually covered with fat.

The Liver

The liver should be of a uniform chocolate colour. It is a two-lobed organ of peculiar cellular structure. The functions of the liver are to purify the digested material brought to it by the blood vessels, and to secrete the bile, which is a very important digestive fluid. In a hen of average size the liver weighs 35 grams. The gall bladder is closely attached to the liver, and it acts as a reservoir for the bile which is secreted by that organ.

The pancreas is a small, yellowish-white, lobulated gland of insignificant appearance lying in the duodenal loop. Although small, this is very important in its function of secreting the pancreatic juice.

The kidneys are located in the excavations of the pelvic roof, and are made up of three irregular lobes. They should be reddish-brown in colour. The functions of these organs are to act on the blood and separate from it liquid waste material, which is eventually passed from the body. In the fowl of average size the kidneys are two and a half inches long. The spleen is a reddish-brown organ situated near the liver. The spleen produces certain changes in the blood.

The intestines are generally of a greyish-white colour. As the food passes through the intestines the digested portions are absorbed into the blood stream and the indigestible portion passed out of the body. In a hen of average size the intestines are 61 inches long. When a hen is in laying condition the ovary contains yolks of various sizes, and the colour varies from a greyish-pink in the small ova to a real yolk colour in the ripe ones.

The "Pines" Poultry Farm

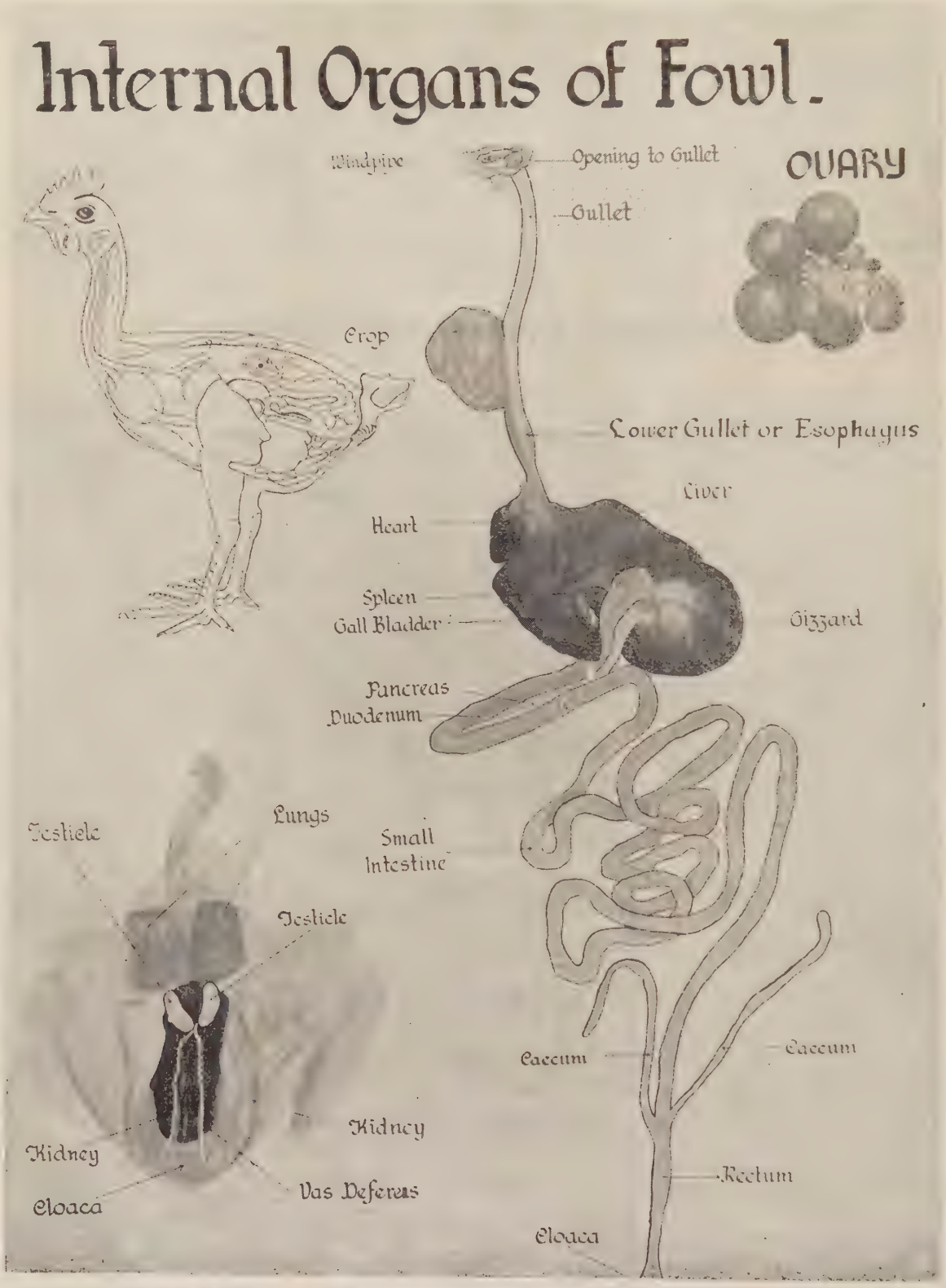
HERETAUNGA. (J. A. TAYLOR) TEL. UPPER HUTT 60.

WHITE LEGHORNS 100 per cent. N.Z. Govt. Wallaceville.

DAY-OLD PULLETS - - - £9 0 0 per hundred

DAY-OLD CHICKENS - - - £4 10 0

Special quotations for large orders.


Internal Organs of Fowl.
Windpipe
Opening to Gullet
OVARY
Gullet
Crop
Lower Gullet or Esophagus
Liver
Heart
Spleen
Gall Bladder
Gizzard
Pancreas
Duodenum
Lungs
Testicle
Small Intestine
Testicle
Caecum
Caecum
Kidney
Kidney
Rectum
Vas Deferens
Cloaca
Cloaca

Artificial Incubation

THE RESULTS obtained from artificial incubation depend very largely upon the machine used and the attention it receives. While there are at the present time good second-hand machines to be obtained, the beginner would be well advised to be very careful in his selection of an incubator. He should avoid the home-made type of unknown quality and those machines without any instructions for operating them.

Location of Incubator

Where a large number of eggs are to be hatched each year, the placing of the machines is very important, and special care should be taken to ensure that the incubator room is properly constructed and ventilated. However, where only one or two small machines are to be worked any well-ventilated room where the temperature does not vary to any great extent should give good results. The incubator should not be placed where the sun may shine on the machine.

Overhaul Your Machine

Each year, before starting the machine, it should be given a good overhaul. Hot water pipes should be cleaned out by running hot water and soda through them. Soft rain water should always be used to fill the pipes in water machines, as hard or spring water is likely to have a detrimental effect on pipes and solder.

Check the level of the machine in order that the temperature is more likely to be even throughout the egg chamber.

Test Thermometers

All incubator thermometers should be tested each season. This can be done by taking a bowl of warm water, about 100 degrees Fahrenheit, and standing the thermometers to be tested with a clinical thermometer at the same level in the water for two or three minutes. If any do not register correctly they should be discarded; in fact, it is always well to have an extra thermometer on hand. Where no clinical thermometer is on hand, a local chemist will often oblige and do the testing.

Care of Lamp

The lamp should be thoroughly cleaned, and the best method of doing

From "No Eggs At All" - to 73 Eggs a Week!

Amazing rise in egg-production in 5 wks. from 17 Birds on Karswood Poultry Spice

This case may be classed as an exceptional one — for it is not very often a poultryowner is unfortunate enough to be without a single egg from as many as 17 hens. But we quote it to illustrate even further that irrespective of the condition and number of birds you keep, the little dash of Karswood regularly in the mash will literally **WORK WONDERS** in egg production. Here are the facts:—

For over 3 months this poultrykeeper's birds had been "eating their heads off" without contributing a single egg. Winter came along with still no signs of egg-production, and as a last resort the birds were given Karswood. Needless to say **THEY LAID.** Within a fortnight the yield was 2 to 3 eggs a day, then gradually increased each day until, within 5 weeks the production had risen to **73 EGGS A WEEK** — an average of over 4 eggs weekly per hen.

Note there was no sudden, spectacular rise in the yield, but a steady, gradual improvement. This is because Karswood does not force the birds but acts in a natural, gentle manner, increasing egg supplies by a natural development of the egg cluster. Karswood is a wonder egg-producer, **SAFE** and **SURE.** Prove these facts to ***your*** profit!

"I feel it my duty to let you know the marvels your Karswood Spice is working with my poultry. I keep 17 hens, and for 3 months received no eggs at all despite the fact they were housed well and fed on the best. I finally made up my mind that 'fowls don't pay.' With winter coming on, and seeing one of your advertisements in the paper, I decided as a last resort to give Karswood a trial. Within the first fortnight they were laying 2 and 3 eggs a day (45 eggs in all) so I decided to buy a further packet. By that time the number of eggs was rapidly increasing and the birds looked splendid. In the third week the birds laid 44 eggs; in the fourth week 51 eggs and the fifth week 73 eggs. I am now getting 11 and 12 eggs a day. All thanks to your splendid spice — it certainly IS a moneymaker."—W.F.C.

(Original letter on file for inspection.)

¼D. A DAY FOR EVERY FIVE HENS IS ALL IT COSTS YOU

1/- packet of Karswood supplies 20 hens for 16 days; 2/- packet supplies 40 hens for 16 days; 7 lb. tin (12/6) supplies 280 hens for 16 days. Try a shilling packet.

KARSWOOD POULTRY SPICE

Increases egg-production without forcing, because it contains ground insects, but no cayenne pepper, &c.

this is by removing the wick and boiling the burner in water to which a little washing soda has been added. Examine the burner or wick sleeve, and ensure that it is not bent in any way. The gauze around the burner needs constant attention to keep it free from dust, fluff, or oil, etc. If this gauze is allowed to get blocked the free circulation of air will be prevented and the lamp will not burn well.

The lamp should be cleaned regularly each day. To do this, remove the lamp from its stand, lift the top, turn up the wick, remove any char with the thumb and forefinger, and if any corrosion is forming on the wick sleeve it should be removed with a small brush or blunt knife. An old toothbrush is very useful for this purpose.

In the centre of the wick sleeve is a small hole which should be kept clean and open, as this is a means of supplying air and causing the lamp to burn brightly and clearly. A fresh wick should be provided at least at the beginning of each season, and once this has been properly trimmed the scissors need not be used again, but each time after cleaning turn the wick up just a little above the sleeve and light it. If it does not burn level it is well to round it off by pressing the high parts down with the fingers and rounding off the corners in the same way so that a round flame is provided.

Kerosene

The best grade of kerosene should be used, and care should be taken not to fill the lamp too full, for if this is done the kerosene is likely to work out on the outside of the bole and cause fumes and perhaps smoking. Lamp chimneys and all flues should be examined, and any accumulation of fluff or dust which is likely to prevent a free circulation of air should be removed.

After the lamp has been filled, cleaned, and replaced the flame should not be turned up too high, for there is a tendency for the flame to "run up" as the burner becomes warmer. For this reason it is a good practice to trim and fill the lamp in the morning so that it will be working steadily at night.

When starting a machine, let it heat up gradually, and when the flame and regulator have been adjusted and an even temperature of, say, 100 degrees Fahrenheit, maintained for a day or so it is safe to put in the eggs.

Turning of Eggs

After being placed in the machine the eggs should not be disturbed for at least 36 hours, after which they should be turned each day from then onwards until the end of the eighteenth day. The object of turning the eggs is to prevent the yolk from settling down towards the shell, and to give the developing embryo exercise and a fresh feeding ground.

A hen turns her eggs several times each day while she is sitting, and if it is practicable to turn eggs in the incubator three times a day it would be an advantage. The turning must be done with great care, for slight jars when turning often cause deaths in shell.

Cooling of Eggs

The time allowed for cooling will depend upon local conditions and the season of the year. If it takes more than one and a half hours to bring the eggs back to the required heat less cooling should be given. However, the time taken to turn the eggs will be sufficient cooling during the first week, and then two or three minutes extra each day until the end of the eighteenth day is required.

Moisture and Ventilation

It is safe to assume that the time and manner of supplying moisture and ventilation to the eggs are perhaps the most important but least understood points in regard to artificial incubation. The best advice is to follow the maker's directions as closely as possible, and as we cannot improve upon Nature in this matter.

It is a good idea to set a hen at the same time as the machine and try to keep the size of the air cell in the incubator the same as that under the hen. A variety of sizes of air cells will be noticed, but one must endeavour to strike an average.

Disinfection

The egg chamber and trays should be thoroughly disinfected after each hatch. This may be done by washing with a three to five per cent solution of a good standard disinfectant.

—C. J. C. CUSSEN, Chief Poultry Instructor, Wellington.

Chick-Sexing Examinations

IF sufficient candidates (three) are offering at each centre the Department will hold practical chick-sexing examinations at Auckland, Wallaceville, and Christchurch during August.

For full particulars apply to the Director of the Livestock Division, Department of Agriculture, Wellington.

DEPARTMENT OF AGRICULTURE

WALLACEVILLE POULTRY STATION

FOR SALE

Now booking orders for eggs, day-old chicks and ten-weeks-old pullets, White Leghorn, Langshan and Australorp (Utility Black Orpington), from recently imported stock.

For full particulars apply to:—
THE POULTRY OVERSEER,
Veterinary Laboratory,
Private Bag to Wallaceville,
WELLINGTON.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Alton Club's Field Day

G. GARNETT, Alton Club.

TWENTY-FOUR members assembled outside the Waimate West Demonstration Farm on 19th April for the field day organised by the Alton Y.F.C. The first move was to the well-kept cow-shed, where Mr. J. E. Davies, Department of Agriculture, outlined the major points dealing with the management of the farm.

After inspecting the old but clean cow shed the party investigated the electric fencing system. This electric fencing is being used merely as an experiment, and so far has been quite successful for subdividing paddocks on the farm for the past season. The party was then shown the sugar beet crop which is to be used as winter fodder for the pigs. An interesting feature on the beet plot was the fact that on places where beet had been grown the year before there was only about half the crop compared with that on land where no beet had been grown previously.

The dairy herd, comprising 74 grade Jersey cows, was in good condition for so late in the season and in view of the fact that it had produced well. One of the many interesting experiments being carried out on the farm is a small patch of grass inside a movable wire netting frame. The grass is pulled by hand and tested for mineral content, the frame being shifted, as required, to a fresh patch.

Passing the concrete silo, we came to a paddock of young grass. This was an excellent "take" and will be an asset in the spring. The trial plots of grasses were next inspected. The number of questions asked showed that the members were there to learn all they could and were using their powers of observation.

An excellent luncheon was provided by the farm committee. Mr. A. Taylor, on behalf of the party, thanked those responsible for the lunch, the farm committee, the manager, and Mr. Davies for the able manner in which he had shown our party over the farm. Mr. Betts suitably replied.

We then travelled to Mangatoki, where we visited Mr. S. Morgan's farm to inspect and judge some of his pedigree Jersey stock. On arrival at the farm we were met by Mr. Morgan.

Mr. Morgan first gave a commentary on his past activities as farmer and breeder, and he next outlined the good and "not so good" points to look for when judging a dairy cow. The cow on which he demonstrated was the champion Jersey cow at the Hawera A. and P. Show this year. She is a splendid type of cow owned and bred by Mr. Morgan. Members judged three choice heifers, then four select rising two-year heifers, and finally three typical young bull calves. Mr. Morgan then placed the animals and gave his reasons in each case.

Afternoon tea was then served. Mr. S. Leigh, chairman of the Alton Club, thanked Mr. Morgan for his talk and demonstration and for acting as judge. Thanks and appreciation were also extended to Mrs. Morgan for providing the afternoon tea. Mr. Morgan suitably replied.

Win a Prize in the Stock-Judging Competition

Young Farmers will have an opportunity next month of testing their knowledge of dairy cows, and, incidentally, of winning a prize, in a stock-judging competition. Sponsored by the Levin Young Farmers' Club, this competition will be conducted through the pages of the Y.F.C. Section of the "Journal."

A number of illustrations of dairy cows will appear in the September number, and competitors will be expected to place them in order of merit, giving brief reasons for so doing. A fee of 1/- per entry will be charged, and the whole of this money will be divided as prizes. To ensure the success of the competition the Levin Y.F.C. is guaranteeing the amount of £7 10s in prize money. The judges, yet to be appointed, will be accredited breeders with show-ring experience.

The illustrations, full conditions, and entry form will be printed in next month's issue of the "Journal."

The object of the competition is to give further publicity to the Y.F.C. movement, and to popularise the Y.F.C. Section of the "Journal." The Levin Young Farmers' Club is to be congratulated on its initiative.

A group taken at the camp. Sitting, second, third, and fourth from the left, are: R. P. Hill, Department of Agriculture, Hastings; W. G. Brownlie (Wairoa), camp chairman; and J. W. Palmer, Department of Agriculture, Hastings.

Success of Educational Week At Hastings

W. G. BROWNLIE, Hon. Secretary Wairoa Club and Chairman of the Hastings Camp.

THE YOUNG Farmers' Educational Week, held at Hastings from May 8 to 13 inclusive proved to be an unqualified success, the schedule being adhered to without any difficulty or confusion.

More than 100 members from the Wellington Council area attended the camp, and were accommodated through the courtesy of the Hawke's Bay Jockey Club in the buildings on the Hastings Racecourse.

For the comparatively short period that the party was assembled and the small cost per individual member it is doubtful whether any other method could have given them such an insight into Hawke's Bay farming and stock breeding. They were enabled to inspect carefully selected areas of highly productive land, and were given the opportunity to view modern seed-cleaning methods and to see samples of ryegrass and subterranean clover seed.

Lagoon Visited

One of the highlights of the week was the tour of inspection through the Ahuriri Lagoon Reclamation Area, where the gradual development from useless salty marsh to highly-productive pasture was clearly demonstrated. The method of draining and pumping the water off the area was of particular interest.

Two outstanding features of the week were the ball, and the field day at the showgrounds. The ball was a great success, and the dancers enjoyed themselves until the early hours of the morning. The popularity of this function prompted the committee to hold a cabaret at the racecourse the following evening, which pleasantly rounded off the activity.

The field day was particularly successful and aroused great interest, the exhibition of stud stock being excellent. Another feature of the week was the lantern lecture contributed

A lunch-time view of the Young Farmers in camp.

by Mr. E. Bruce Levy, Director of the Grasslands Division. Mr. Levy exhibited slides depicting his travels through Europe, and provided a running commentary which was of great interest and instructional value.

Committee Gratified

Although the committee felt the strain of the week it was very gratifying to feel that its efforts had met with such success. Apart from the enjoyment and educational side of the activity, it was certainly of value also from the point of publicity, and enabled the people of Hawke's Bay to realise what a force the Y.F.C. movement has now become.

I would like to refer to the wonderful assistance given by the District Secretary, Mr. R. P. Hill, and also by Mr. J. W. Palmer, who acted as marshal of the camp. A tribute must also be paid to Mr. A. J. Galpin, to whose co-operation and assistance much of the success was due. The members who attended the camp were a very fine crowd, and were in every way a credit to the movement, and I wish to thank them for their attention to all matters of routine and discipline.

Lochiel Club's Field Day

JOHN McC. THOMPSON, Lochiel Club.

A SUCCESSFUL field day was held by the Lochiel Y.F.C. on 22nd April, visits being made to two local farms and also to the Winton Experimental Area.

Talks and demonstrations were given at Mr. Peter Shaw's farm on draught horses by Mr. Shaw and Mr. T. Pettigrew. Members were shown various horses, and the essential points in selecting horses were demonstrated. Among other matters, the necessity of ensuring that foals were properly fed during the first winter was stressed.

At Mr. J. T. May's farm the party was shown the preparation of moulds for concrete posts. Concrete pipes, strainers, fences, tanks, troughs, and floors were seen, all of which had been made by Mr. May and his assistants. The care and housing of all farm implements was discussed by Mr. May, and great interest was taken by the party in the operation of a drain-plough fitted with a mechanical lift. A vermin-proof barn also created interest. Before leaving the farm the party was entertained at afternoon tea by Mrs. May.

Members walking over some of the trial plots at the Winton Experimental Area. Messrs. Harbord and Kemp (with dog) in the foreground.

At Winton Experimental Area members were met by the manager, Mr. J. Kemp, and Mr. W. L. Harbord, Department of Agriculture. Mr. Harbord explained and discussed the various trials being carried out. Members took a keen interest, particularly in the ryegrass gazing trials.

At each place visited votes of thanks were passed for the assistance so willingly given to the club.

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Apiti Club's Show

F. J. S. HOLDEN, Fields Instructor, Palmerston North.

MEMBERS of the Apiti Young Farmers' Club held a most successful show on March 15. The day was run on A. and P. lines and attracted a big crowd.

Classes for horses, dairy cattle, sheep, and dogs were confined to Young Farmers' Club members, but there were open classes for cookery, needlecraft, flowers, etc. The success of the day was marked by the large number and high standard of the entries.

Ring events proved popular, and novelty events, including tug-o'-war, a draught horse Derby, slow car race, and various competitions were also held. A sheep judging competition was also run for the Young Farmers, who returned many good cards.

The show was officially opened by Mr. A. Lawson, Advisory President of the Kimbolton-Kiwitea Club, through a broadcasting set, which also proved useful in keeping competitors up to the mark.

The sheep pens at the Apiti Club's Show.

This is the first event of its kind in the district, and the Apiti Club is to be congratulated on its enterprise and the success with which the day was organised. It is hoped that other clubs may follow their example to the benefit and extension of the movement.

Nelson-Marlborough Party's Tour Of South Island

D. M. E. MERRY, District Secretary, Nelson.

EARLY on the morning of 23rd April, the Nelson contingent of the Young Farmers' party, comprising 24 members, set out on the first stage of their South Island tour. At Blenheim the Marlborough members were met and the combined party, now 46 strong, proceeded in two buses on the journey to Christchurch.

Under the guidance of Messrs. McGillivray and Jolly, Department of Agriculture, Christchurch, the party proceeded to Cashmere Hills. A stop was made at the "Sign of the Takahe," and here we joined Mr. J. O. Thompson and learned details of the construction and interior decoration of this unique rest house. The Christchurch District Y.F.C. Committee entertained us to morning tea, after which followed a scenic drive along the Summit Road. At a point overlooking the Peninsula Mr. McGillivray pointed out interesting topographical features and gave an account of the early history of the Banks Peninsula settlement. Proceeding via Sumner, the party then returned to the city for lunch.

In the afternoon the Pure Seed Station, Lincoln, was visited. The director, Mr. J. W. Hadfield, gave a short description of the station's work, following which a tour of inspection of buildings and equipment was made. Members were interested in the linen flax shown them, and the various processes associated with fibre retting.

Lincoln College Visited

Later in the afternoon we were welcomed at Lincoln College by Professor E. R. Hudson. Professor Hudson escorted the party over part of the college property and explained developmental work recently undertaken. Mr. J. W. Calder outlined the college's plant breeding programme and conducted the visitors over the college experimental plots. Then followed an inspection of the college buildings and stud stock.

The next day the party was en route to Timaru. Stopping at Ashburton, we lunched at the A. and P. Association grounds, where Mr. R. Inch, Depart-

ment of Agriculture, Ashburton, members of farming and other organisations, and several local Y.F.C. members were met. After viewing the Ashburton Anzac parade the tour party continued southward.

On Wednesday morning we left Timaru, accompanied by Messrs. Leitch and Stafford, Departmental Instructors, and visited several farms. Mr. Leitch explained the methods by which increased production had been gained, tracing the influence of good management, suitable seeds mixtures, and adequate lime and fertiliser applications. After lunching at Waimate the next visit was to the property of Mr. J. G. Ruddenclau, where his magnificent seed crop of 93 acres of certified Montgomeryshire red clover excited general admiration. Mr. Stafford explained how irrigation was effected in South Canterbury, and demonstrated the manner in which race water was flooded over pasture and cropping land.

At Waitaki Bridge we joined Mr. T. A. Sellwood, Department of Agriculture, Oamaru, and in the evening we were the guests of the North Otago Farmers' Union and entertained at a picture performance. On Thursday morning the party visited Waitaki Boys' High School and attended morning chapel.

Tour of Dunedin

At Dunedin Mr. S. H. Saxby, Department of Agriculture, Dunedin, and Mr. S. R. Whyte, Honorary Secretary, Otago-Southland Council, met the buses. Next morning a tour of the city was made, with morning tea at the Botanical Gardens as the guests of the Otago-Southland District Committee. In the afternoon we were conducted over the Dominion Fertiliser Company's works at Ravensbourne by the manager, Mr. H. D. Kerr.

At Invercargill the party was met by Mr. A. Stuart, Department of Agriculture, Invercargill, and several most interesting farm visits made. In the evening a welcome was extended by the Mayor of Invercargill, Mr. J. H. Hanna.

On Monday morning the party set out for Queenstown. A halt at Winton Demonstration Farm in the morning allowed a visit to be made and members were shown over the property, to return with an appreciation of the merits of certified pastures of Hawke's Bay stock. Arriving early at Queenstown, we were met by Mr. G. G. Calder, Department of Agriculture, Alexandra, and a number of Y.F.C. members availed themselves of a launch trip on Lake Wakatipu. In the evening we were met by local Y.F.C. members and entertained at a dance.

Picturesque Country

Leaving Queenstown next day, the buses threaded their way through picturesque country to commence the ascent of the Crown Range. From the summit glorious views spread out on all sides. Passing down over the range, the journey was continued to Pembroke and through to Glendhu Bay, where in a picturesque setting at the lakeside we were the guests at morning tea of Mr. and Mrs. W. A. Scaife. A visit to the farm property followed. At Hawea Flat the Women's Division of the Farmers' Union met us and an enjoyable afternoon tea was provided. En route to Cromwell a short visit was paid to the Department's Central Otago experimental area at Pisa Flat, where regrassing trials were explained by Mr. Calder.

After a night at Cromwell the Waitaki Hydro-electric Power Station was inspected, and from Timaru an early return was made to Christchurch.

Friday morning saw us assembled early for the journey home via the Lewis Pass. The Nelson and Blenheim buses parted early in the evening on their diverging routes at Kawateri, and amid hearty cheers closed the last chapter of the Nelson-Marlborough combined tour.

Financing And Stocking A Farm

D. S. ANDERSON, Enfield Club.

DURING the last three seasons competitions fostered by senior members have been conducted by the Enfield Young Farmers' Club. The main reasons for the promotion of these competitions have been to encourage members to voice their views on subjects under discussion, to enable them to become proficient speakers, and to increase their interest in farming matters generally.

One of the most interesting evenings last season was spent in discussing the following subject:—"Imagine yourself starting life as a farmer by purchasing a 200 acre farm at £20 per acre in North Otago. Your capital is £1500. Prepare a paper showing how you would finance and stock the farm. Describe your farming methods."

This question was taken home, and in nearly all cases dad's assistance was sought. Everyone showed a small credit balance at the end of the year, due no doubt to the fact that we all started as bachelors. One member did attempt to prove that a wife would be a wonderful asset on his dairy farm, but needless to say, he was well squashed.

Thought Required

If you sit down to answer the problem, you will realise how much thought is required. This is how I set about it.

The purchase price of 200 acres at £20 per acre would be £4000, and the cash I have on hand is £1500. Of the £1500 on hand I would pay down £800. I assume the vendor would want more, but I would endeavour to show him that it was in his own interests to leave me with as much capital as possible to work the farm. I have always been told that the land should carry the debt and not the stock. Eventually he would agree to leave the balance of £3200 on mortgage at 4½ per cent.

The next job would be to approach a bank manager or stock firm and start an account. It might be necessary to arrange for a small overdraft later on.

I found, on making inquiries, that besides paying down £800 I would have to pay stamp duty and other legal expenses amounting to about £60, leaving me with £640 on hand.

The next problem concerned stock and plant. Here every young farmer in the club differed, more especially over the question of tractor versus team. I favoured starting with a team, because the amount of work to be done would not be great and good horses and second-hand implements could be purchased at reasonably low rates.

Stock and Plant

My stock and plant would be as follows:—

250 breeding ewes	£375
4 horses	£100
Plough, discs, harrows, drill, binder, and dray	£85
Total	£560

This comprises £560 of my remaining capital of £640, leaving me with £80 to serve as a stand-by for a while.

On the property is a mixture of various aged grasses, including 50 acres of old, well-established pasture. These paddocks should respond well to a dressing of 2cwt. of superphosphate per acre. This would undoubtedly be a great help in fattening the lambs on the mothers.

The next thing to do would be to plan out the season's work and establish a rotational system of crops. These crops would occupy about 50 acres. Of these, 10 acres would be for oats, 10 for rape, and 10 for turnips.

With the coming of the white butterfly pest, it is questionable whether it is advisable to grow rape in future, so I think I would play safe by establishing a good stand of lucerne. This would comprise 20 acres. The first 10 acres would be sown out with rape and used for fattening purposes. The other 10 would be fallowed and sown in the autumn.

Position at Christmas

My position at Christmas time should be:—10 acres of oats, 10 acres of rape, 10 acres of turnips, 10 acres of rape and lucerne, and 10 acres fallowed.

In January I would begin ploughing 15 acres of lea, which, plus the 10 acres of rape ground, should give me 25 acres for wheat in the following season.

In December the topdressed paddocks should produce 100 fat lambs off the mothers. Of the 300 lambs reared, about 50 per cent. of them should draft off the grass at good weights. The remainder would have ample feed on the rape and lucerne block to finish them off. The other 10 acres of rape could be sold.

In estimating the balance at the end of the year, returns are based on 1937-38 prices:—

Receipts.	£	s.	d.	Expenditure.	£	s.	d.
Returns from lambs ..	365	0	0	Interest and rates ..	160	0	0
Wool	90	0	0	Seeds	17	0	0
Sale of Rape	35	0	0	Fertilizer	43	0	0
				Shearing	10	0	0
				Depreciation of flock ..	40	0	0
				Chaff	20	0	0
				Living Costs	40	0	0
				Sundries	50	0	0
	£475	0	0		£380	0	0
				By Balance	£95	0	0
	£475	0	0		£475	0	0

This balance of receipts and expenditure shows a credit balance of £95.

You will readily understand why I have to remain a bachelor.

Budget Balanced

I have just managed to hold my own the first year, but the following season I would hope to increase the output of fat lambs by increasing the ewe flock a little. As I took possession late in the season I did not have time to make preparation for wheat, but the following season the returns from 25 acres of wheat should improve my position considerably.

In putting forward their papers every young farmer showed a different system of farming the property, and in the opinion of the judges all costs were under-estimated. For instance, in purchasing the livestock, not one of us remembered that a good working dog was an absolute necessity on every farm.

I can assure Young Farmers that the subject aroused a most interesting discussion, and we gathered a great deal of valuable information from it.

GO TO THE SNOW

Thrills of Winter Holidays

Thousands of New Zealanders, during recent years, have found a new joy of living on the great white highways of Mt. Ruapehu, Mt. Egmont and Mt. Cook. Winter turns the moisture of the air into delightful whiteness, and gives the sun the right opportunity to do his best in the clear tonic atmosphere.

Old bodies feel young again, and the young feel younger.

Cosy hotels are near the widespread snowfields where novices are quickly taught by experts to enjoy the sport of skiing.

Have a chat with relatives or friends about forming a party for a holiday which will give you a new outlook on life.

Your railways will help you to keep down the cost.

ENJOY the HEIGHTS of DELIGHT

Among the Clubs: Reports on Activities

Western Southland.

Dipton.—Lantern lecture by Mr. McFedries showing "The Gyrotiller at Work." A field day was held on Messrs. D. McRae and Sons' farm at Dipton West; members were shown concrete posts and pipes being made, and a demonstration was given on Romney Marsh ewes, followed by a judging competition. Experimental plots on the farm were also inspected. Nine members attended a meeting of the Lochiel Club by invitation, to view films exhibited by Mr. Saxby. At a previous unreported meeting an address was given by the Rev. I. R. Polson on "The Industrial Revolution."

Lochiel.—Arrangements for football match with Thornbury Club. Discussion re allocation of the McKinnon Trust Money. Lecture by Mr. A. Stuart, Department of Agriculture, on "Liming and Top-dressing." At the previous meeting films on agricultural subjects were exhibited by Mr. S. H. Saxby, Department of Agriculture. Members arranged to visit Drummond, to assist in the formation of a club.

Thornbury.—Scenic films exhibited by Mr. Ted Thomas; short talk on "Lincoln College" by Mr. G. O. Fallow. At the previous meeting Mr. S. H. Saxby, Department of Agriculture, exhibited a series of films on agricultural subjects.

Woodlands.—Lecture by Mr. J. Bell (holder of the Order of Serving Brother of St. John) on "First Aid." Assisted by charts the speaker described the framework of the human being, showing the functions and composition of the component parts. He explained the various types of bone fractures, and the necessary treatment and bandaging, and dealt with the muscular system and also the treatment of severed veins, etc. At the previous meeting final arrangements were made for a club dog-trial. Address given by Mr. Taylor on "The Export of Chilled Beef."

Wyndham.—Talks by club members. James Winter spoke on his work and studies at Lincoln College, and W. Brown and A. Howe described the recent Y.F.C. tour of the North Island in which they took part. At the previous meeting films on agricultural subjects were exhibited by Mr. S. H. Saxby, Department of Agriculture.

Eastern Southland.

Crookston.—Lecture by Mr. Taylor, Department of Agriculture, on "Trouble Affecting the Legs and Feet of a Horse."

Five Rivers.—Arrangements for a debate with Lumsden Farmers' Union. Dance to be held. Club debate, "Up-country v. Down-country Farming," the former led by J. Hamilton and the latter by B. Reitcheson. The judge, Mr. A. Hamilton, declared the "Down-country" side the winners.

Maitland.—Election of new secretary; W. R. Thayer appointed. The evening was devoted to general talks—impromptu subjects; some interesting discussions on various farming and economic problems resulted.

Moa Flat.—Arrangements for a field day and ball. Address by Mr. Revie, of Crookston, on "The Marketing of Farm Produce," the speaker's three main points were meat, dairy produce, and wool. A successful field day was held on Mr. G. M. Love's property, the demonstrations including "Grasses" (Mr. W. Faithful, Department of Agriculture), "Setting a Plough" (Mr. J. McLeod), "Working a Dog" (Mr. I. Stevens), "Killing and Dressing a Sheep" (Mr. D. McNeil). Sports, etc., proved an added attraction. There was an attendance of nearly 70, including 18 visiting club members, and about 30 older farmers.

Otama.—Preliminary notices of stock-judging in August at Lincoln. Report by the chairman, W. Logan, on the Eastern Southland executive meeting. Lecture by Mr. Peirson, of Gore, on "Ailments of Sheep." The speaker dealt fully with footrot, paralysis in ewes, lambing troubles, paralysis, etc.

South Otago.

Clinton.—Committee appointed to arrange for a Y.F.C. concert. Lecture by Mr. A. F. Greenhall, Department of Agriculture, on "Pasture Improvement." At the annual meeting, not previously reported, the officers were elected as follows:—Advisory president, Mr. Jas. Murray; club chairman, Ernest Roseveare; secretary and treasurer, Robt. Roy.

Lawrence.—Members who took part in the recent Y.F.C. tour of the North Island gave their experiences and impressions of the trip.

Milton.—Business meeting. Arrangements made for club dance.

Stirling.—Films on agricultural and general subjects exhibited by Mr. J. M. Smith, Department of Agriculture.

Warepa.—Arrangements for club ball. Talk on "Pasture Management" by Mr. A. F. Greenall, Department of Agriculture, followed by an interesting half-hour discussion. At the previous meeting a lecture was given by Mr. MacDonald (Otago-Southland Pig Breeders' Association) on "The Pig Industry in New Zealand."

Central Otago.

Upper Clutha.—Talk by Mr. Mills, Inspector of Stock, on "The Stock Acts." At the previous meeting impromptu speeches were given by all members present.

Dunedin.

Palmerston.—Arrangements for visit to Dunedin Chamber of Commerce; short radio address to be given by chairman on this occasion. Mr. A. Ballingall, a second year diploma student at Lincoln College, gave an address on "Farm Pests," he also gave an interesting talk on Lincoln College.

South Taieri.—Arrangements for ploughing match. Lecture by Dr. Billings on "Economics in a Changing World."

West Taieri.—Lecture by Mr. Taylor, on "Parasites."

North Otago.

Duntroon.—Annual meeting. Officers elected: Advisory president, Mr. H. Harvey; club chairman, A. Francis; secretary, K. O. Williamson.

Enfield.—Selection of team for debating. Impromptu speeches. At the previous meeting a discussion took place on the programme of lectures, etc., for the year.

Five Forks.—Lecture by Mr. Ingram, Department of Agriculture, on the Acts administered by the Livestock Division of the Department of Agriculture. Articles from the "New Zealand Journal of Agriculture" were read and discussed at the previous meeting.

Hampden.—Business meeting. Arrangements for club dance.

Papakaio.—Lecture on "Farm Implements" by Mr. E. Reid.

Waitaki-Hilderthorpe.—Annual meeting. Officers elected: Advisory president, Mr. J. B. Chapman; club chairman, C. Grocott; secretary and treasurer, B. A. Paton.

South Canterbury.

Arno.—Open discussion among members on "General Farming Problems."

Cannington-Cave.—Selection of teams for debating. Arrangements for annual dance. Lecture by Mr. W. Stafford, Department of Agriculture on "The Certification of Seeds." Address by Lieut. E. Kerr on "Military Training." At previous unreported meetings a debate was held, the subject being "Is Top-dressing a Payable Proposition?" and an address was given by Mrs. Bingswanger, recently from Europe, on "Conditions in Italy and Germany."

Geraldine.—Cup presented by the Farmers' Union for Y.F.C. stock-judging at the saleyards. Discussion among club members and Farmers' Union members on "The Value of Trees and Shelter on the Farm." At previous unreported meetings an address was given by Mr. A. J. Hammond on his "Trip to China," and a discussion took place with Farmers' Union members on "The Influence of the Nutrition of the Ewe on Fat Lamb Production."

Hunter.—An outline of the inter-club debating programme for the year was given by the chairman, it was announced that the Crown Tenants' Association had donated a cup for competition. Messrs. Ansley, McConnell, Scott, Geary, and Gregan were nominated as members from whom the club team would be finally selected. Impromptu speeches were given by club members.

Maungati.—Arrangements made for members to inspect irrigation works. Address by Mr. E. J. Lukey, Government Veterinarian, on "Conditions in the Chatham Islands." Impromptu speeches were given by members at the previous meeting.

Milford.—Address by Mr. J. Turley on his trip to New South Wales. The speaker dealt particularly with his impression of the farming methods. A club debate was held, the subject being "That Horses are Superior to Tractors." Speakers: L. Livesey, R. Dale, and N. Palmer (affirmative); W. McCormick, R. Palmer, and L. Trumper (negative). The judge, Mr. G. Mulligan, gave the award to the negative team.

Southburn-Lyalldale.—A. Ward reported meeting representatives of the Cannington-Cave and Maungati Clubs regarding the method of deciding the winners of the Howell Cup. Address by Mr. E. J. Lukey, Government Veterinarian, on "Conditions in the Chatham Islands." Members of the Women's Division were present by invitation. At the previous meeting Mr. J. Newbiggin, of St. Andrews, gave a talk on "The Training of Sheep Dogs."

Waihaorunga.—Arrangements for field day. Address by Mr. Patersen, of Timaru, on "The Future Outlook of the Farming Industry." At the previous meeting Mr. C. C. Leitch, Department of Agriculture, exhibited two films, entitled "Our Daily Bread" and "The Romance of the Reaper." At an earlier meeting the annual club debate was held. This took the form of impromptu debates, the teams of three-a-side being given 15 minutes for preparation. The subjects were: (1) "That the Standard of Living in New Zealand is Too High," won by the negative; (2) "Should Prospective Husbands Do Housework" won by the affirmative; (3) "That Town Life is Preferable to Country Life," won by the affirmative. Mr. Griffiths, Waimate, judged the debates.

Mid-Canterbury.

Ashburton.—Address by Mr. Warren, of Darfield, on "The Manufacture of Wool."

Hinds.—Club dog trials were held in the Hinds Domain, the competing dogs being owned by B. Simmons, F. Skinner, J. Johnston, W. McConnell, and W. Kieley.

Christchurch.

Darfield.—Business meeting. Committee appointed for ploughing match, arrangements for football match with Ellesmere Club; speakers

selected for 3YA radio broadcast. Presentation of trophies for sheep judging and stacking competitions. Arrangements for billeting visitors on occasion of Y.F.C. stock-judging competitions at Lincoln in August. At a previous unreported meeting it was decided to hold meetings every three weeks

Ellesmere.—Arrangements for football match with Darfield Club. Meeting devoted to the preparation of radio talk.

Hororata.—A miniature rifle shooting competition between members of the Farmers' Union and the Young Farmers' Club resulted in a win for the club by 37 points.

Teddington.—Address by Mr. K. Baines on his tour of England and France, and a canoe journey down the River Danube through Central Europe The speaker illustrated his talk by means of "movie" films.

West Milton.—A successful field day was held at Mayfield and Methven. The irrigation scheme at Mayfield was inspected, members being conducted over the works by Mr. Edgar Smith, engineer-in-charge. Demonstrations were given as follows:—Stud Southdown and Border Leicester sheep (Mr. R. J. Low, Highbank) and stud Romney sheep (Mr. A. F. Marr, Methven). Afternoon tea was provided by Messrs. Low and Marr. There was an attendance of 22, including four members of the Methven Club.

North Canterbury.

Amuri.—"Question Box" meeting. At the previous meeting a lecture on "The History of Forestry in New Zealand" was given by Mr. Roach, of the Forestry Department, Hanmer. Arrangements for a field day were also made, and for the annual dance.

Cust.—Committee appointed to take charge of a "hare drive." Talk by D. Blackmore (club member) on his trip to the North Island.

Hawarden.—Report on district committee meeting, submitted by delegates. Lectures by Mr. R. I. Black, on "The Harvesting of Grass Seed." At the previous meeting a talk was given by Mr. L. D. Cameron on "The Education and Working of the Collie Dog."

Oxford.—Address by Mr. N. Hadler on "The Evolution of the Earth and Life." A presentation was made to T. Reid (a club member) on the occasion of his approaching marriage. A field day was held on Mr. J. Dean's property at Homebush, mainly taking the form of an inspection of the plantations and shelter-belts, with a talk and demonstration by the owner.

Scargill-Omihi.—Donations from various vice-presidents acknowledged. Lecture on "Parasite Control" by Mr. Knotts, Department of Agriculture.

Westland.

Murchison.—Address by Mr. A. D. Mercer, Department of Agriculture, on "Farming in Western Australia." Resolved that at each meeting four members be selected to give two-minute impromptu talks. At the previous meeting arrangements were made to meet a party of Scargill-Omihi Club members on tour, and a talk on "How to Conduct Meetings" was given by the advisory president, Mr. C. Lynch.

Nelson.

Dovedale.—Arrangements for dog trials and a dance. Talk on "Road Safety" by the local traffic inspector.

Motupiko.—Discussion re field day. Talk by S. Mead (club member) on the recent Y.F.C. tour of Otago, Southland, etc. At the annual meeting officers were elected as follows:—Advisory President, Mr. V. Nicholls; Club Chairman, R. Mead; Secretary and Treasurer, G. Nicholls.

Moutere.—Discussion re combined club sports picnic. Donation of £2 10s to be made towards cost of entertaining visiting Y.F.C. touring parties. Talk on "Photography" by Mr. D. Merry, Department of Agriculture.

Marlborough.

Flaxbourne.—Debate with Seddon Club, the subject being "That the Completion of the South Island Main Trunk Will Not Materially Assist the Development of Marlborough." The Seddon team were the winners. At the previous meeting a practice debate on the same subject was held by the club members, the speakers being L. Butt, R. Andrews, G. McNabb, D. Matthews (affirmative), and A. Wooding, R. Forsyth, T. Loe, F. Butt (negative). The judge, Mr. D. R. Wilkie, gave the decision to the negative team. At a previous unreported meeting A. Wooding, T. Archibald, and R. Andrews gave accounts of their southern tour with the combined Marlborough-Nelson Clubs.

Wairarapa.

Alfredton.—Arrangements for a field day. Lantern lectures by Mr. N. Lamont, Department of Agriculture, on "Rotational Grazing."

Ballance.—Address on "Fencing" by Mr. J. Moore, Ballance.

Carterton.—Report on club dance. Sum of £5 voted to District Committee's fund for entertaining Y.F.C. touring parties. S. Fisher appointed as club delegate on Wairarapa P. and A. Society's general committee. Address by Mr. A. Ross on "Points to Observe When Buying a Farm."

Mangatainoka.—Lecture by Mr. N. Lamont, Department of Agriculture, on "The Food Value of Pastures and Crops."

Martinborough.—General discussion on "The Managerial Side of Dairying and Sheep Farming."

Masterton.—Address by Sir Wm. Perry, "Penrose," on "Land Development." The speaker dealt with such matters as liming and draining, and referred to his experiences with his own farm.

Pongaroa.—Annual meeting. Officers elected: Advisory President, Mr. L. Johnston; Club Chairman, G. Pim; Secretary, T. E. Hall; Treasurer, A. Pim.

Manawatu.

Bunnythorpe.—Address by Mr. J. Linklater, advisory president, on "Parliamentary Procedure."

Colyton.—Arrangements for special meetings at which all members will take part in debates in preparation for the Viles Shield Inter-Club Debating Contest. The District Secretary, Mr. Chamberlain, spoke on forthcoming Y.F.C. activities, including the Winter Show and proposed Massey College short course. An interesting account of experiences on the recent South Island tour was given by the club chairman, R. Shortall.

Fitzherbert.—Team to be entered for Viles Shield Inter-Club Debating Contest. Mr. Holden, Department of Agriculture, spoke on Y.F.C. activities, including the Y.F.C. Day at the Manawatu Winter Show, and the proposed short course at Massey College. He also described the methods of judging for the N.Z. Farmers' Mutual Fire Assurance Association's Cup, donated for club efficiency.

Halcombe.—Selection of footballers for Y.F.C. matches at Manawatu Winter Show. Address by Mr. Dick French, of Beaconsfield, on his recent trip to South Africa.

Kairanga.—Guides selected for school children at the Manawatu Winter Show. Discussion on Y.F.C. show entries and football matches at show. Arrangements for social and also for annual dance. The club chairman, D. Rowland, spoke on the recent South Island tour. Messrs. Neilsen and Fraser also gave short talks.

Kimbolton-Kiwitea.—Selection for debating team. Discussion on projected field day. The Dominion Organising Secretary, Mr. S. Freeman, exhibited sound films.

Levin.—Practice debates held to assist in the selection of a debating team. (a) "That Town Supply is More Desirable than Factory Supply." Speakers: N. Lewis, C. Crowe, G. Gimblett (affirmative), and B. Bartholomew, K. Elliott, P. McLeod (negative); the affirmative won by 249 points to 234. (b) "That it Requires More Ability to Run a Dairy Farm than a Sheep Farm." Speakers: P. Bartholomew, F. Rolston, G. Elliott (affirmative), and P. Carter, B. Stewart, A. Challies (negative); the affirmative won by 254 points to 249. Rev. J. Dennis acted as judge.

Oroua Downs.—Entries for root-crop classes at Winton Show. Nominations for football match. Club to compete in the inter-club debating contest. Short addresses by club members; F. Shailer, on the South Island tour; R. Pedersen, on the Hastings educational week; L. Funnell on his recent tour to Australia. Mr. H. de O. Chamberlain, Department of Agriculture exhibited films of agricultural interest.

Otaki-Te Horo.—An address was given by Mr. J. Miller on "Farming in Canada." A special meeting was also held to select a team to debate against the Kairanga Club in the inter-club contest.

Pohangina Valley.—Selection of team for Viles Shield Debating Contest (H. M. Linklater, W. Howell, and R. Smart). Five members booked in for the short course at Massey College during July. Delegates reported on the District Executive meeting. Talk on "Onion Growing" by H. Howell, and talk by H. M. Linklater, chairman, on the recent meeting of the Wellington Council.

Rangiotu.—A club representative to be co-opted by the Rangiotu Farmers' Union. Mr. Chamberlain, District Secretary, spoke on the Y.F.C. activities at the winter show, including Y.F.C. guides for the school children, and the Y.F.C. dog trials and football matches. The Dominion Organising Secretary, Mr. S. Freeman, exhibited sound films of general interest; he also addressed the meeting on Y.F.C. affairs generally.

Rangiwahia.—Challenge to a debate issued to the W.D.F.U. The club chairman, M. Wood, gave a talk on his recent tour of the South Island, and each member present spoke for three minutes on "The Management of Sheep."

Rongotea.—Discussions with delegates from the W.D.F.U. regarding (1) the means of using the proceeds of combined euchre parties and dances, and (2) arrangements for holding a concert and dance. A team was selected to compete in the inter-club debating contest.

Shannon.—Arrangements re inter-club debating contest, and also club dance. Mr. Holden, Department of Agriculture, outlined projected Y.F.C. activities, including the Y.F.C. Day at the winter show, the district Y.F.C. dance, and also the Wanganui educational week. The team to compete in the Viles Shield Debating Contest was selected at the previous meeting, and consisted of C. Watson, J. A. Smith, and J. Aitchison.

Tokomaru.—Mr. Holden, Department of Agriculture, outlined Y.F.C. activities at the Manawatu Winter Show. Mr. S. Freeman, Dominion Organising Secretary, exhibited sound films of general interest, and spoke on Y.F.C. affairs generally.

Whakarongo.—Address by Mr. G. Spall on "The Sydney Royal Show." Moving pictures of the U.S.A. were exhibited by Mr. McKegg. The team to compete in the inter-club debating contest was elected at this meeting.

Woodville.—Discussion on the matter of a suitable hall for club meetings. Arrangements for club dog-trials and stock-judging competitions in July. At the previous meeting Mr. A. Ramsden, of Kumeroa, addressed the members on "Hill-Country Top-dressing."

Wanganui.

Marton.—Balance-sheet of annual dance presented; profit of over £4. Election of three club members to A. and P. Committee (H. Kimpton, J. Henderson, and L. McLeay). Report on District Committee meeting. Arrangements for short talk by members at next meeting.

The club chairman, Mr. A. B. Marshall, spoke on the educational week to be held in Wanganui.

Taihape.—Arrangements for a debate. Lantern lecture by Mr. Hill-Motion on "Nutrition and Disease."

South Taranaki.

Eltham.—Team to be entered in the ten-a-side football tournament in July. Mr. C. A. Wilkinson, M.P., gave an interesting talk on trip to England at the Coronation time; he dealt particularly with native life on the many islands en route.

Hawera.—Address by Mr. Whittlestone, of the N.Z. Rennet Co., on "The Different Units that Make Up a Milking Plant." This was followed by a talk on "Mastitis" by Mr. A. Leslie, M.R.C.V.S. The speaker dealt with ways in which the incidence of mastitis in dairy herds can be reduced by the correct adjustment of the various units of the milking plant.

Kaponga.—Two teams to be entered in the ten-a-side football tournament at Eltham in July. Arrangements for football match against the Pukengahu Club. Questions on agricultural and general subjects were written down by members and answered in turn by other members, general discussion then taking place.

North Taranaki.

Hillsborough-Tarurutangi.—Team to be entered in the ten-a-side tournament in July. Address by Mr. R. B. Wood, M.R.C.V.S., on "Various Diseases in Cattle."

Mangamahoe.—Discussion re debates and speeches, etc. Address by Mr. V. Davies on "Farm and Home Shelter Trees."

Mangorei.—Talk by Mr. Ferriday, Inspector of Stock, on "The Duties of Officers of the Different Divisions of the Department of Agriculture." At the previous meeting a debate was held, the subject being "Rotational Ploughing and Re-seeding v. Harrowing, Surface-sowing, and Topdressing." Mr. Elliott, Department of Agriculture, acted as judge, and gave a short talk on the subject debated.

Okau-Tongaporutu.—Business meeting. Arrangements for field day, etc.

Tikorangi.—Table tennis tournament to be run; neighbouring clubs to be invited to participate. Address by Mr. R. C. Smith on his "Trip to England." The speaker related his experiences en route and during his short stay in England; he also gave a detailed account of the care and management of stud rams of which he was in charge in the return voyage to New Zealand.

Toko.—Arrangements for a dance. Club debate held, the subject being "Dairy Farming v. Sheep Farming." The speakers were G. Anderson, B. Anderson, and C. Rowe (dairy farming), H. Ancell, P. Jones, and L. Kilsby (sheep farming). Mr. G. A. Blake, District Secretary, acted as judge and awarded the verdict to the dairy-farming supporters. A field day was held on the properties of Mr. Were and Mr. Richard. A demonstration of the pastures was given by Mr. A. G. Elliott, Department of Agriculture, after which a pasture-judging competition was held among the members present.

Urenui.—Report on club dance, which proved a success both socially and financially, a profit of £7 being made. A team to be entered for the ten-a-side football tournament at Eltham. Address by Mr. Mander, manager of the fertiliser works; the speaker illustrated his visit to Nauru Island by means of photographs. At the previous meeting members from the Tikorangi and Karawaka Clubs were present to meet the Dominion Organising Secretary, Mr. S. Freeman, who spoke on ways and means of fostering the Y.F.C. movement and club work generally, and exhibited sound films.

Southern Hawke's Bay.

Hastings.—Club debate, "That Tractors are More Suitable for Farm Work than Horses," won by the affirmative.

Norsewood.—Arrangements for a dance. Seven members who attended the Hastings educational week gave short talks on the activities, etc., that took place during the week. At the previous meeting Mr. J. H. Luke gave an address on "The Farmers' Union and the Young Farmers' Clubs."

Takapau.—Arrangements for a field day. Mr. L. C. Rolls, of Napier, gave an address on his recent tour through Europe, and exhibited a movie film.

Waipukurau.—Address by Mr. R. B. Price on "The Use of Explosives on the Farm." At the previous meeting Mr. C. R. Watson gave a talk on "Farm Accountancy."

Northern Hawke's Bay.

Matapiro.—Meeting held at the residence of Mr. A. W. Whyte, Crownthorpe. Discussion on tree-planting scheme; suggested that club endeavour to make arrangements, if in accordance with the scheme, to plant trees for shelter alongside the holding paddocks in the district. Lectures arranged on "Wool" and "Lambing Troubles" for the July and August meetings respectively. The four members who attended the Hastings educational week each gave a talk of ten minutes on their impression of the week. A vote of thanks was moved to Mr. and Mrs. Whyte for the use of their home, and also for the supper provided after the meeting. At the previous meeting, which was held in the Shereden School, a talk was given by Mr. Whyte on "Draught Horses." Mr. Whyte, who is a well-known show judge, made his address both interesting and instructive.

Putorino.—Discussion re Centennial tree-planting project; members signified their approval of the scheme. Address by Mr. A. D. M. Laing, Government Veterinarian, on "Diseases of Sheep." Five-minute talks by members: "Running Down Wild Horses" (A. Laidlaw) and "North Island Sheep-dog Trials" (E. Smyth). At the previous meeting a six months' programme, drawn up by the committee, was adopted. Mr. Monteith, manager of Kotemaori Station, gave an address on "Breaking in Rough Country."

Poverty Bay.

Gisborne.—Addresses as follows:—Mr. W. E. Chamberlain gave a brief criticism of the keeping of the club book, pointing out faults and suggesting improvements; Mr. D. Cameron spoke on "Australia," Mr. E. M. Bates, District Secretary, gave a brief address on his recent trip to Australia, and Mr. D. Withers gave an account of the Hastings educational week.

Tolaga Bay.—General business. Paper by H. Irving, Jr. (club member), entitled "A Letter from a London Wool Broker."

Taumarunui.

Ohura.—General discussion on conduct of meetings, duties of members, etc.

Taumarunui.—Arrangements re display court at Taumarunui Show. Lantern lecture by Mr. J. M. Hopkins, Department of Agriculture, on "Hill-country Experiments on Hard-fern." Mr. Hopkins also dealt with the "Identification of Grasses."

Eastern Bay of Plenty.

Edgecumbe.—Committeee appointed to deal with Centennial tree-planting scheme; discussion re Y.F.C. courts at Hamilton and Whakatane Shows. A social evening followed. At the previous meeting interesting discussion on "Farming in General" took place, led by Mr. C. R. Taylor, Department of Agriculture, and Mr. C. O. McCracken, advisory president.

Opotiki.—A field day was held on Mr. G. E. Bennett's farm at Waioeka, with a total attendance of 14. Mrs. Bennett spoke and demonstrated on "Poultry in General," including Black Orpingtons, layers, fatteners, and Khaki Campbell ducks; she also dealt with "Pheasants and Their Rearing."

Waimana.—Arrangements re Y.F.C. Court at Bay of Plenty Show. Talk on "Voluntary Military Training" by Mr. C. N. White.

Western Bay of Plenty.

Tauranga.—Final arrangements for dance to welcome North Auckland Y.F.C. touring party. A team to be entered in the Western Bay of Plenty seven-a-side football tournament.

Te Puke.—Arrangements re field days to be held at Mr. Ross's piggeries and at the Old Showgrounds. Entries for Waikato Winter Show dealt with.

Waihi.—Proceeds of recent dance (£1 15s 6d) voted to District Committee funds. Practice debate held, all present being included. Radio broadcasts and show entries discussed.

Rotorua.

Horo Horo.—Final arrangements for tour; party of 20 members to visit Ruatoki, Te Kaka, Tikitere, and Mohaka Development Schemes, under the leadership of Sir A. T. Ngata, M.P.

Rotorua-Ngongataha.—Arrangements for a field day. Address by Mr. Harwood, principal of Rotorua District High School, on the "Conduct of Debates." Questionnaire discussion on "The Growing of Root Crops" by G. McFetridge and D. Hunt (club members); comments on the discussion by Mr. H. M. Martin.

Waikato.

Huntly West.—Club debate, "Single v. Double Stripping."

Kakepuku.—Field day at Te Awamutu. Demonstrations included "Buttermaking" (Mr. A. J. Sinclair) and "The Care and Management of Pigs" (Mr. H. J. Webber). There was an attendance of 20.

Tahuna.—Badminton set to be purchased. Arrangements for a trip to Ruakura Experimental Farm. Debate to be held at next meeting.

Te Kowhai.—Talk on "Herd Testing" by Mr. Sheaf, of the N.Z. Herd Testing Association. Films exhibited by Mr. H. Woodyear-Smith, "Land Deterioration" and "Butter Factories."

Auckland.

Franklin.—Discussion re debating contest, dances, etc. Arrangements for trip to Geldine Farm, Span Farm, and Crum Brick and Tile Co. Club debate, 'Tractor v. Horses," meeting divided into two sides, and after the leaders had spoken all other members were required to speak. Mr. F. D. Wood, Sen., acted as judge, and gave the award to the tractor supporters.

Wellsford.

Port Albert.—Members attended the Farmers' Union meeting to hear a lecture given by Mr. A. R. Gorbey on "Diseases in Stock." A field day was held on Mr. H. M. Neal's property at Te Hana; members and visitors were conducted round the farm by Mr. Neal, who explained the development of the property, giving details of costs, etc. There was an attendance of over 50.

Wellsford.—Discussion re field day, and arrangements for a debate. Mr. R. Whitmore addressed the club on "How to Conduct a Meeting."

Dargaville.

Marohemo.—Programme of lectures, etc., drawn up. Club debate, "City v. Country Life."

Ruawai.—Discussion re entertainment of Bay of Plenty touring party. Programme of lectures, etc., drawn up. Mr. E. H. Arnold, Department of Agriculture, spoke on the Y.F.C. tour of the Waikato. Impromptu speeches by club members.

Tangiteroria.—Address by the advisory president, Mr. R. J. Bale, on "The Conduct of Meetings and the Duties of Club Officers."

Kaitaia.

Oruru.—Business meeting. Arrangements finalised for the entertainment, etc., of the Bay of Plenty Y.F.C. touring party.

Health Notes for the Farm

Contributed by the Department of Health

Good Ventilation Is Necessary For Perfect Health

WHEN our prehistoric ancestors learned the art of making fire by elements they made a great stride towards laying the foundation of our civilisation. Instead of covering the entire mouth of the cave with skins they left a small opening at the top to provide for the removal of smoke. Enough outdoor air leaked in to keep the supply of oxygen sufficient to support respiration and sustain life. Such is believed to be the origin of ventilation.

Ventilation can be considered from two aspects—firstly, external ventilation, and secondly, internal ventilation. In relationship to external ventilation, model city planning should provide streets of sufficient width and should regulate the height of buildings and also limit the extent upon which the land may be built to allow a free circulation of air about all structures and admit a flood of sunshine for at least a few hours during the day.

The streets of some American cities resemble canyons rather than business thoroughfares, with the result that the sun and air currents are excluded. External ventilation also includes the provision of a sufficiency of open spaces, children's play areas, and reserves. These not only beautify a city, but also help to ventilate it and add comfort and health to the inhabitants.

Internal Ventilation

The object of internal ventilation is to supply to our houses air of a chemical composition as near as possible to that found outside. It has been proved by calculation and by actual experience that an adult requires about 2000 cubic feet of fresh air per hour. This amount is the ideal to be obtained if possible, particularly in bedrooms, which we occupy on the average about one-third of our lifetime.

One of the practical difficulties of ventilation is that the composition of the air may be considerably altered without the body being aware of it. On the other hand, alterations in the physical qualities of the air which disturb our heat regulatory mechanism are very much apparent.

Thus, when we complain that a room is stuffy it can, as a rule, be proved that the chemical composition of the air is within normal limits, but the physical qualities have so altered that the body is having difficulty in keeping its temperature from rising above normal limits. The normal loss of heat from the body is influenced by the temperature, moistness, and movement of the surrounding air.

Heat Stagnation

In crowded buildings the air entangled in the clothes becomes warmed up to body temperature and saturated with moisture from perspiration. As there is little movement of the air to alter these conditions the temperature immediately rises, giving the symptoms of heat stagnation, with which we are all familiar. The symptoms are depression, headache, dizziness, and tendency to sickness, culminating in actual fainting and death if relief is not obtained.

An extreme example of heat stagnation is that of the tragedy known as "The Black Hole of Calcutta," which occurred in the military prison of Fort William, India, in 1756. One hundred and forty-six adults were shut in a room 18ft square and with but two small windows on one side to ventilate it. They were shut in at 8 p.m., and within an hour some were dead, and when the door was opened at 6.20 a.m. the following day only 23 were found to be alive. All these deaths were due to heat stagnation.

An example will now be given of symptoms produced by bad ventilation in a very cold climate where the body has no difficulty in remaining cool. In Dr. Mawson's book on the Antarctic, "The Home of the Blizzard," is described the following incident. The explorers had dug a shelter in the ice, the wind being so severe that a hut would not stand. This dug-out was called "Alladin's Cave," and at the time of this incident was occupied by three men, who were using a primus stove for heating and cooking. We shall quote the actual text of the incident from the book:—

"Hoosh was cooked and about to be served when Stillwell, who was in charge of the primus stove, collapsed. Close immediately seized an ice axe, stood up, thrust its point through the snow-choked entrance, and fell down overcome. Larsen became powerless at the same time. An hour and a half

later, it was reckoned, the party revived and cleared the entrance. The hole made by the ice axe had been sufficient to save their lives."

Lack of Oxygen

The symptoms in this example were due to lack of oxygen, which had been used in breathing and by the primus stove.

There are also to be found persons occupying undesirable, ill-ventilated bedrooms such as described by O. Henry in his story "The Skylight Room."

"Clara, the maid, would escort you up the carpeted ladder that served for the fourth flight and show you the skylight room. It occupied seven by eight feet of floor space in the middle of the hall. On each side of it was a dark lumber room. In it was an iron cot, a washstand, and a chair, a shelf was the dresser. Its four bare walls seemed to close in upon you like the sides of a coffin, your hand crept to your throat, you gasped, you looked up from a well and breathed once more. Through the glass of the little skylight you saw a square of blue infinity. . . . 'Two dollars, suh,' Clara would say."

The difficulty in distinguishing pure air and bad was well recognised many years ago, particularly in mines where white mice are kept, as they show symptoms of air impurity before men. In these days white mice have been used in submarines for the same purpose, and it is gratifying to remember that their use for that purpose during the Great War has been commemorated in the National Scottish War Memorial, Edinburgh, where carvings of all branches of the services, including white mice, are incorporated in the memorial.

Common Deficiencies

The extreme examples quoted seldom occur in actual practice, but minor deficiencies of ventilation are common, particularly in crowded bedrooms. In mines, tunnels, large public buildings, suites of offices, factories, etc., the necessity for providing a sufficient amount of fresh air is so obviously essential that it demands the installation of expensive plant for the purpose.

In a climate such as ours, if sufficient space is allowed for each individual there is never any difficulty in natural ventilation in the home, provided the windows are kept open to a reasonable extent. However, if overcrowding occurs windows should be kept wide open to ensure a rapid air change.

The problem of window ventilation is the prevention of draughts, and numerous devices are available. The importance of sufficient air in sleeping quarters cannot be overemphasised.

One can preserve fruit by sealing it in jars, for fruit keeps best without air, but one cannot preserve children by keeping them in tightly-sealed rooms. The crowding of families in small, badly-lighted, ill-ventilated houses involves the risk of a physically inferior race. Consumption and other diseases breed apace in those living under such conditions.

Elementary Principles

One of the elementary principles of ventilation is that the fresh air inlet should be as large as possible, for the larger it is the less the velocity of the current required to supply the necessary volume of air. Another is that the inlets should be arranged so as to give a maximum diffusion; that is what is meant by "avoiding draughts." The size and shape of the room are important factors in any system of ventilation. A small room properly ventilated is better than a large one improperly ventilated.

Where it is difficult to ventilate satisfactorily the air should never be allowed to become stagnant. When there is no natural movement the air should be set in motion by artificial means, as by an electric fan. Even a hand fan is of some hygienic use.

The effects produced by long exposures in rooms below normal in respect to ventilation include the following derangements of health:—Anaemia, debility, disturbance to digestion, depressed vitality, and lowering of resistance to certain infections, particularly common colds and other diseases of the nose and throat.

Large buildings are now being heated by hot water or steam radiators. These methods are very efficient and economical, but there is a tendency to overheating, and the inmates become like hothouse plants and lose the power, to a certain extent, to control the body temperature. The best temperature to maintain in homes, offices, shops, is 68 degrees F. A great deal of harm is done by maintaining higher temperatures, especially if the moisture content of the air is not kept up to about 40 per cent., which is roughly equal to the evaporation of two gallons of water every day in an ordinary-sized room.

Danger of Illness

Those whose occupations confine them within four walls show, as a general rule, a higher death rate, and the absence of free-moving air in the places in which they work provide conditions which increase the danger of contracting infection. Does not this statement furnish a very good argument for free ventilation of all work places, be they shop, office, or factory?

Good ventilation increases the power to work. For the full enjoyment of personal health, fresh and moving air is an urgent necessity for the human body night and day. Yet even with people who live an open-air life there is sometimes a tendency to live in stuffy rooms.

Stephen Leacock, in "Sunshine Sketches of a Little Town," refers to the same thing in his story of an excursion on the "Mariposa Belle." "The women ,the older ones," he says, "all gravitated into the cabin in the lower deck, and by getting round the table with needlework and with all the windows shut they soon had it, as they said to themselves, just like home." What is true of the cabin of the "Mariposa Belle" is, unfortunately, true of many homes.

An abundant supply of fresh air is necessary to perfect well-being. Hot, stuffy rooms lower human vitality. The object of ventilation is comfort and health, and its art consists in adapting indoor conditions to indoor life. It has been well said that good ventilation and circulating air in buildings and out-of-door living are needed for vigorous health, and that cool breezes blowing round the head, the radiant heat of the sun, and a warm ground to stand on are the ideal outdoor conditions.

A farmer in Eastern Southland has a paddock part of which was sown with a grass seeds mixture in which timothy was included, and part where no timothy was sown. There is a striking difference between the two areas; where the timothy was included is very much better grazed, the clover bottom is better, and is generally more vigorous in appearance compared with the area without timothy.

The Farm Home and Kitchen

Contributed by the Association for Country Education

Soap and Soap-Making

SOAP is first mentioned by Pliny the Elder, a Roman who lived in A.D. 23-79. He tells that it was prepared from goat's tallow and beech tree ashes, and was employed for giving the hair brilliance. In those days it was the custom of the aristocracy to anoint their bodies with oil and sweet incense. This, after a time, became rancid and had to be removed. When they wished to rid themselves of this rancid oil or grease they would first smear their bodies over with wood ashes, then bathe in water. The wash water purged the alkali from the ashes, and this, combining with the oil or grease from the body, formed an emulsion or soap which, in turn, was easily washed off, leaving the skin clean.

A little later some enterprising person tried soaking the ashes in water first, then using the clean liquor. This was a great improvement on former methods and the real beginning of soap-making. As the years went by, methods were still further improved, soap factories sprang into existence, and soap-making became a commercial industry. The principle, however, remains the same.

Main Ingredients

Two main ingredients are necessary —fat and alkali. Any fat consists of a combination of fatty acid and glycerol. In the making of soap, the alkali reacts with the fatty acid, forming a salt of the fatty acid, which we call "soap," and setting free the glycerol. Perhaps we can understand the reaction better if we illustrate it by this equation:—

Fat + Alkali = Soap + Glycerol.

That is:—

Tristearin + Sodium Caustic = Sodium Stearate + Glycerol.

This change is called "saponification," and takes place on the application of heat. Different fats and different alkalies are, of course, used according to the nature of the soap required. Animal fats and caustic alkali give harder soaps and are used specially in the making of laundry and household soaps, while the vegetable fats, such as olive and palm oils, are used for the milder, finer, toilet soaps.

Whatever kind of alkali is used, the chemical reactions involved in the manufacture of soap conform to definite chemical laws. A given weight of fat or oil requires a definite weight of alkali (caustic soda or potash, etc.) to "saponify" it, that is, to change from fat into soap. If too much fat is used the excess will be left in the soap as unsaponified fat; if too much alkali is used, the excess will remain in the soap as "free alkali."

Saponification

Saponification is rather a slow process, and if not properly controlled the reaction may not go on to completion, in which case the soap will contain both free alkali and unsaponified fat. For certain rough cleaning work a little free alkali may be tolerated. On painted or varnished surfaces, soaps should be very sparingly used, if at all, and if used they should certainly contain no free alkali. For laundry purposes, except for woollens and silks, a little free alkali is permissible. Excess alkali injures the fabric, causing the fibres to disintegrate and break. The best laundry soaps are those which contain little or no free alkali. (Try dipping a piece of wool in a solution of caustic soda and see what happens.)

Ordinary scouring powders and soap containing free alkali attack and stain aluminium ware. Laundry soaps should not contain unsaponified fat, and toilet soaps should be completely devoid of free alkali, for this attacks the skin and may cause serious skin troubles, particularly if the soap also contains other impurities. It is not economy to use cheap soap. The reputation of reliable makers is usually sufficient to guarantee value for money, and "no name" soaps should be treated with suspicion.

How to Make Soap

Two hundred years ago soap-making was carried on mostly in the home. Just as spinning and weaving were common household duties, so was the making of soap. It was a long process, involving time and patience.

First of all "lye" had to be made by pouring water through a large barrel of wood ashes. As the water trickled through it dissolved potash from the ashes. This potash solution was then put in a large iron pot and lime added. The lime changed the solution of potash from the ashes into a stronger kind of potash, which we call "caustic potash."

The actual soap-making was done in a big iron pot suspended over a fire out of doors. The fat and the "lye" (or alkali, as it really was) were boiled together and stirred with a long stick until the mixture was smooth and thick, like cream. The resultant soap was soft like a jelly, and of the type that we today call "soft soap." Soap for washing hands was made from bay berries which, when boiled, yielded a fat which combined with the lye to make quite a good toilet soap. All these soaps took long hours and much care

to prepare, so that it is no wonder soap was regarded as a luxury.

Today, soap-making at home is not nearly such an arduous process, and although we can buy soap quite cheaply in the shops, it is sometimes a problem to know just what to do with the many scraps of fat we collect in the kitchen, and soap-making is a very good way of using them up. Unlike the people of two hundred years ago, we do not have to make up our own "lye" by allowing water to trickle through a barrel of wood ashes, but can buy our alkali in a tin.

The first thing to do after we have collected enough fat is to find a good standard recipe and then to follow it to the letter. Examine the sample of home-made soap and see what you think of it. Here is the recipe and method by which it was made:—

Home-made Soap

Ingredients:

Caustic soda, 1 lb.
Water, 1½ quarts.
Clarified fat, 6½ lbs.

Method:

Note: It is much the wisest plan to use a benzine tin for the soap pot, for caustic soda will soon ruin any tin or iron household saucepan.

Clarify the fat by melting it and letting it cook slowly with water. Then let it cool, and the clear fat will solidify on top of the water, leaving behind any salt and dirt. Lift off the fat and remelt it, allowing it to cook slowly until it no longer "crackles." This means that any water left in the fat has evaporated, carrying with it much of the fatty odour. Then strain the fat through fine muslin to make sure that it is clean.

Dissolve 1 lb. of commercial caustic soda in 1½ quarts of water. The liquid will become quite hot. Cool down until it is just warm. Then take 6½ lbs. of the warm liquid fat and pour it slowly into the warm caustic lye, stirring with an agate spoon or a stick until it is the consistency of honey. Line an enamel pan with greased paper or damp calico and pour the soap mixture into it. Cover and leave in a warm place twenty-four hours, when it will be ready to cut up and be stored away to dry. After about a month it will be ready for use.

This is, of course, the simplest kind of soap and is used for washing dishes and other household purposes; it is the most common type made in the home. Soft soaps are made directly, using caustic potash instead of caustic soda. Because of the difficulty of procuring pure, natural oils and the impossibility of "milling" the soap to produce a fine, smooth product it is not practicable to attempt to make toilet soaps at home. There are many good brands on the market, and the prices are not prohibitive.

Uses of Soap

We all know that water alone will clean to a certain extent. Why is it that we use soap at all?

In cleaning a greasy surface, the soap first gives close contact by lowering the surface tension of the water, and finally emulsifies the grease, that is, distributes it throughout the wash water. We aid the mulsification by rubbing or agitation. So it is that dirt on our hands, which is held there by the natural oil or grease from our skin, is easily washed off by the aid of soap. Soap is definitely a valuable aid to the housekeeper. As a cleanser, soap dissolves up in water and forms suds, which in turn act as an agent in carrying off the dirt. This dirt is most often held in by grease, which is attacked and saponified by the alkali set free in the decomposition of the soap.

Extra Ingredients

As a disinfectant, soap is used in hospitals to sterilise hands and instruments, in laundries to assist in sterilising clothes, for toilet purposes to clean the skin and hair, and in homes for dishes and all general cleaning.

As we said before, the two main ingredients in soap are fat and alkali. There are also other materials added for different purposes, and it is well that we should know something about what these "adulterants" are. Foreign material is a term which may be applied to all substances not necessary to the actual formation of soap. They may be added to soaps to increase weight, to aid in cleansing, for medicinal uses, or for aesthetic reasons. If they have a really cleaning or medicinal value they add to the quality of the soap, but if they are added merely to increase weight or to hide poor quality ingredients they become adulterants.

Whether we make soap from our own ingredients or whether we purchase it in the shops it is economy to make or to get the best. Soap of good quality soon pays for itself. A poor soap is a source of waste, and a pure, unadulterated soap will do twice the work of a poor one, and with less injury to the materials cleaned.

A certain amount of water (12 to 14 per cent.) is necessary in a good soap, as this keeps it sufficiently soft to cause it to blend readily with the wash water and consequently to make suds easily and quickly. Excess water makes soap soft and may be an adulterant if in very large quantities, for then it will add considerable weight.

When we buy soap by the cake we pay little attention to the percentage of water, but when the soap is bought by weight, as it is in institutions and sometimes on farms, it is very necessary that the percentage of water be within the limit.

Resin

Resin is prepared from crude pine turpentine by distillation, and is added to soaps because it produces a lather or false suds with water. It is also a weight adulterant. Resin takes the place of some of the fat, and, as it is cheaper than fat, resin soaps may be made more cheaply. They make good suds and dissolve readily in water, even when the water is cold, but these soaps dissolve away so much more quickly than all pure, non-resin soaps that they are no cheaper in the long run.

To a certain extent, resin soaps may clean, but as the suds are sticky and gum-like they form gum layers on the tubs and boiler, and should the suds not hold but a scum form, this adheres to the clothes and "yellows" them. Resin soaps may be detected by their yellow colour and the sticky feeling of a freshly-cut surface. We strongly advise all home-makers to make and use non-resinous soap.

Extra Cleaners

Very often, other substances are added to soap for the purpose of increasing its cleansing properties. These include soda, borax, ammonia, kerosene, and naphtha.

Soda, borax, and ammonia are alkalies, whose effect is to soften the water, thus increasing the suds, or to saponify or "cut" the grease and so set it free. The saponified grease gives up the dirt it holds and allows it to float free.

Soda is used in carbonate form as washing soda. It is hard on the hands and injurious to wools, silks, and colours. It is better to buy a "neutral" soap and, when you wish, add soda in

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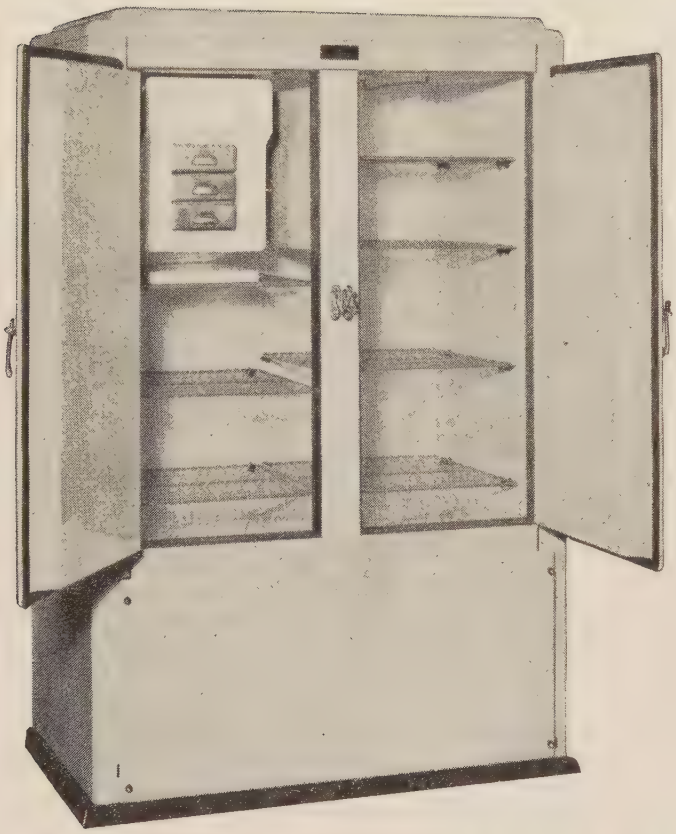

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liquid form to the washing water. We can test whether a soap contains sodium carbonate (washing soda) by a very simple, practical test. Hold a flake of soap for a few seconds in your mouth. If soda is present in any special amounts the soda will "bite" the tongue. A neutral soap is almost free from any taste.

Borax and ammonia are very mild alkalies, and are harmless to fabrics. Borax is also a mild bleach. Both are grease solvents, and borax is specially effective for the washing of white woollens, as it is too mild to harm the fibre.

Kerosene in Soap

Kerosene loosens the dirt, and is also valuable as a grease solvent. It is specially useful for washing greasy types of dirt, such as shoe polishes and vaseline. Benzine soaps are also used for cleaning greasy fabrics.

Other Types

Sand and pumice are abrasive materials which clean by scratching. We use soaps containing these ingredients more for household cleaning than for laundry.

Resorcin, quinine, olive oil, and carbolic acid are all added to soaps for special reasons, and such soaps are used for bathing and disinfecting the scalp and skin and for cleansing delicate or diseased skin.

There are on the market today many and various highly perfumed and coloured cheap soaps. Very often the perfumes and colour are used to cover up impurities in the soap, and we should accept these factors in high quality soaps only. In the cheaper grades the perfume is added just prior to pressing into cakes, whereas in the better grades of toilet soaps the perfume is thoroughly worked into the soap by a further "milling."

Two Good Hints

Here are two ways of using up scraps of soap which are always being left over in the kitchen and bathroom:—

(1) Get an empty treacle tin (7 lb. size), give it a wire handle, and into it put all the soap scraps. Fill it with water and set it on the back of the stove. This makes an excellent soap-jelly for use when dish-washing, and it is much more economical than soap powder. If the scraps of soap are added from time to time and the water in the tin replenished as the soap jelly is used up there will always be a ready supply.

(2) Scraps of toilet soap which are always being found in the bathroom can be tied in a piece of open weave material and used in the back porch or kitchen for washing hands. This will not only use up the scraps, but will probably save a good deal of waste of the larger cakes of soap.

Recipe for Cleanser

Ingredients:

Sandsoap, 1 cake.
Boiling water, 2 cups.
Soap extract, 1 small packet.
Boiling water, 1 cup.

Method:

Shred the cake of sandsoap finely and dissolve it in the two cups of boiling water, stirring until smooth. Dissolve the soap extract in the one cup of boiling water and stir till dissolved. Stir the two mixtures together until a smooth paste of fairly thick consistency is formed. Pour into tins while still hot.

Recommended Recipes

STUFFED TOMATOES.

Method.—Cut a small slice from the top of medium or large tomatoes. Scoop out the pulp and mix it with soft breadcrumbs, salt, and pepper. For additional flavour add finely chopped or minced ham, bacon, or left-over meat (or cooked mushrooms when in season). Return the mixture to the tomato cups, filling each one well. Sprinkle with buttered breadcrumbs and bake ten to twenty minutes in a moderately hot oven. (Served with crisp bacon this makes a very appetising and nutritious tea or luncheon dish.)

SAVOURY TOMATOE SAUCE.

Method.—Cook together (without additional liquid) equal quantities of chopped onion, tomato, and sour apple. Season well and serve with roast beef—or serve on toast for luncheon or tea.

APRICOT SHORTCAKE.

2 cups flour.
½ teaspoon salt.
4 teaspoons baking-powder.
3 oz. fat (butter, lard, or dripping).
2 tablespoons of sugar.
¾ cup milk.

Method.—Sift together flour, salt, and baking-powder. Cut in the fat and add sugar. Mix to a soft dough with the milk. Roll dough ½in thick. Cut in circles 2½in in diameter, and place two together with melted butter in between. Bake at 450deg. F. When cooked, split apart, cover half with a layer of apricots, place top in position. Garnish with fruit and whipped cream. Serve with fruit syrup. (Peaches or plums may be substituted for the apricots.)

DEVILLED TOMATOES.

Method.—Cut large tomatoes in half, brush over thinly with mustard mixed to a thin paste with water. Sprinkle with finely chopped chives; season with salt and pepper; dot with butter and bake in a hot oven.

BUTTERSCOTCH APPLES.

5 apples.
2-3 cups brown sugar.
½ cup water.
¾ cup milk.
1 tablespoon cornflour.
⅛ teaspoon salt.
1 tablespoon butter.
½ teaspoon vanilla.

Method.—Pare apples and cut in quarters. Make a syrup of sugar and water. When it boils, add apples and cover and boil gently until apples are tender. Remove apples from syrup. In a separate pan, mix milk and cornflour, stir and cook until thickened, then add syrup. Boil a few minutes. Add salt, butter, and vanilla. Pour over apples.

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